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MEDICAL INQUIRIES

AND

OBSERVATIONS.

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OUTLINES
OF THE
PHENOMENA OF FEVER.

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AS many of the diseases which are the subjects of these volumes belong to the class of fevers, the following remarks upon their phenomena are intended to render the principles and language I have adopted, in the history of their causes, symptoms, and cure, intelligible to the reader.

I am aware that these outlines will suffer by being published in a detached state from the general view of the proximate cause of disease which I have taught in my lectures upon pathology, as well as from its being deprived of that support which it would receive from being accompanied with an account of the remedies for fever, and the times and manner of exhibiting them, all of which would have served to illustrate and establish the facts and reasonings which are to follow upon this difficult and interesting inquiry.

I shall not attempt to give a definition of fever. It appears in so many different forms, that a just view of it can only be given in a minute detail of all of its symptoms and states.

In order to render the outlines of fever, which I am about to deliver, more simple and intelligible, it will be necessary to premise a few general propositions.

I. Fevers of all kinds are preceded by general debility. This debility is natural or accidental. The former is the effect of the sanguineous predisposition, and exists at all times in many constitutions. The latter is induced,

1. By such preternatural or unusual stimuli, as, after first elevating the excitement of the system above its healthy grade, (and thereby wasting a part of its strength, or what Dr. Brown calls excitability, and Darwin sensorial power,) afterwards reduced it down to that state which I shall call debility of action. Or,

2. It is induced by such an abstraction of natural stimuli as to reduce the system *below* its healthy grade of excitement, and thereby to induce what Dr. Brown calls *direct* debility, but what I shall call debility from abstraction. This general debility is the same, whether brought on by the former or the latter causes. When induced by the latter, the system becomes more excitable than when induced by the former causes, and hence an attack of fever is more frequently invited by it, than by that state of debility which succeeds the application of an undue portion of stimulating powers. To this there is an exception, and that is, when the remote causes of fever, act with so much force and rapidity as *suddenly* to depress the system, without an intermediate elevation of it, and before sufficient time is given to expend any part of its strength or excitability, or to produce the debility of action. The system in this state, is exactly similar to that which arises from a sudden reduction of its healthy excitement, by the abstraction of stimuli. This debility from abstraction, moreover, is upon a footing with the debility from action, when it is of a *chronic* nature. They both alike expend so much of the quality or substance of excitability, as to leave the system in a state in which irritants are seldom able to excite the commotions of fever, and when they do, it is of a feeble nature, and hence we observe persons who have been long exposed to debilitating causes of both kinds, often escape fevers, while those who are *recently* debilitated, are affected by them, under the same circumstances of exposure to those causes.

That fevers are preceded by general debility I infer from their causes, all of which act by reducing the excitement of the system, by the abstraction of stimuli, or by their excessive or unusual application. The causes which operate in the former way are,

1. Cold. This is universally acknowledged to be a predisposing cause of fever. That it debilitates, I infer, 1. From the languor which is observed in the inhabitants of cold countries, and from the weakness which is felt in labour or exercise in cold weather. 2. From the effects of experiments, which prove, that cold air and cold water lessen the force and frequency of the pulse.

2. The debilitating passions of fear, grief, and despair.

3. All excessive evacuations, whether by the bowels, blood-vessels, pores, or urinary passages.

4. Famine, or the abstraction of the usual quantities of nourishing food.

The causes which predispose to fever by the excessive or unusual application of stimuli are,

1. Heat. Hence the greater frequency of fevers in warm climates, and in warm weather.

2. Intemperance in eating and drinking.

3. Unusual labour or exercise.

4. Violent emotions, and stimulating passions of the mind.

5. Certain causes which act by over-stretching a part, or the whole of the body, such as lifting heavy weights, external violence acting mechanically in wounding, bruising, or compressing particular parts, extraneous substances acting by their bulk or gravity, burning, and the like.* The influence of debility in predisposing to fevers is further evident from their attacking so often in the night, a time when the system is more weak than at any other, in the four and twenty hours.

II. Debility being thus formed in the system, by the causes which have been enumerated, a *sudden* accumulation of excitability takes place, whereby a predisposition is created to fever. The French writers have lately called this predisposition "vibratility," by which they mean a liability in it to be thrown into vibrations or motions, from pre-existing debility. It is not always necessary that a fever should follow this state of predisposition. Many people pass days and weeks under it, without being attacked by a fever, by carefully or accidentally avoiding the application of additional stimuli or irritants to their bodies: but the space between this state of predisposition, when it is recent, and a fever, is a very small one; for, independently of additional stimuli, the common impressions which support life sometimes become irritants, and readily add another link to the chain of causes which induce fever, and that is,

III. Depression of the whole system, or what Dr. Brown calls indirect debility. It manifests itself in weakness of the limbs, inability to stand or walk without pain,

* Cullen's First Lines

or a sense of fatigue, a dry, cool, or cold skin, chilliness, a shrinking of the hands and face, and a weak or quick pulse. These symptoms characterize part of what I have called in my lectures the forming state of fever. It is not necessary that a paroxysm of fever should follow this depressed state of the system, any more than the debility that has been described. Many people, by rest, or by means of gentle remedies, prevent its formation; but where these are neglected, and the action of stimuli, whether morbid or natural, are continued,

IV. Re-action is induced, and in this re-action, according to its greater or less force and extent, consist the different degrees of fever. It is of an irregular or a *convulsive* nature. In common cases, it is seated primarily in the blood-vessels, and particularly in the arteries. These pervade every part of the body. They terminate upon its whole surface, in which I include the lungs and alimentary canal, as well as the skin. They are the out-posts of the system, in consequence of which they are most exposed to cold, heat, intemperance, and all the other external, and internal, remote and exciting causes of fever, and are first roused into resistance by them.

Let it not be thought, from these allusions, that I admit Dr. Cullen's supposed vires naturæ medicatrices to have the least agency in this re-action of the blood-vessels. I believe it to be altogether the effect of their elastic and muscular texture, and that it is as simply mechanical as motion from impressions upon other kinds of matter.

That the blood-vessels possess muscular fibres, and that their irritability or disposition to motion depends upon them, has been demonstrated by Dr. Vasschuer and Mr. John Hunter, by many experiments. It has since been proved by Spallanzani, in an attempt to refute it. Even Dr. Haller, who denies the muscularity and irritability of the blood-vessels, implies an assent to them in the following words: "There are nerves which descend for a long way together through the surface of the artery, and at last vanish in the cellular substance of the vessel, of which we have a specimen in the external and internal carotids, and in the arch of the aorta; and from these do not the arteries seem to derive a muscular and convulsive force very different from that of their simple elasticity? Does not it show

itself plainly in *fevers*, faintings, palsies, consumptions, and passions of the mind?"*

The re-action or morbid excitement of the arteries discovers itself in preternatural force, or frequency in their pulsations. In *ordinary* fever, it is *equally* diffused throughout the whole sanguiferous system, for the heart and arteries are so intimately connected, that, like the bells of the Jewish high priest, when one of them is touched, they all vibrate in unison with each other. To this remark there are some exceptions.

1. The arteries are sometimes affected with great morbid excitement, while the natural functions of the heart are unimpaired. This occurs in those states of fever in which patients are able to sit up, and even to walk about, as in pulmonary consumption, and in hectic fever from all its causes.

2. The heart and pulmonary artery are sometimes affected with great morbid excitement, while the pulsations of the arteries of the wrist are perfectly natural.

3. The morbid excitement of the arteries is sometimes greater on one side of the body than on the other. This is obvious in the difference in the number and force of the pulsations in the different arms, and in the different and opposite appearances of the blood drawn from their veins, under equal circumstances.

4. The arteries in the head, lungs, and abdominal viscera are sometimes excited in a high degree, while the arteries in the extremities exhibit marks of a feeble morbid action. Fevers attended with these and other deviations from their common phenomena, have been called by Dr. Alibert, *ataxiques*. They occur most frequently in malignant fevers.

While morbid excitement thus pervades generally or partially the sanguiferous system, depression and debility are increased in the alimentary canal, and in the nervous and muscular systems. In the stomach, bowels, and muscles, this debility is occasioned by their excitement being abstracted, and translated to the blood-vessels.

I shall now endeavour to illustrate the propositions which have been delivered, by taking notice of the manner in

* First Lines, sect. 32. of the chapter on Arteries.

which fevers are produced by some of their most obvious and common causes.

Has the body been debilitated by exposure to the cold air? Its excitability is thereby increased, and heat acts upon it with an accumulated force: hence the frequency of catarrhs, pleurisies, and other inflammatory fevers in the spring, after a cold winter: and of bilious remittents in the autumn, when warm days succeed to cold and damp nights. These diseases are seldom felt for the first time in the open air, but generally after the body has been exposed to cold, and afterwards to the heat of a warm room or a warm bed. Mild intermittents have frequently been observed to acquire an inflammatory type in the Pennsylvania hospital, in the months of November and December, from the heat of the stove rooms acting upon bodies previously debilitated and rendered excitable by cold and disease.

Has there been an abstraction of heat by a sudden shifting of the wind from the south-west to the north-west or north-east points of the compass, or by a cold night succeeding a warm day? A fever is thereby frequently excited. These sources of fever occur every autumn in Philadelphia. The miasmata which exist in the body at that time in a harmless state, are excited into action, in a manner to be mentioned presently, by the debility from cold, aided in the latter case by the inaction of sleep, suddenly induced upon the system.

Again: has the body been *suddenly* debilitated by labour or exercise? Its excitement is thereby diminished, but its excitability is increased in such a manner that a full meal, or an intemperate glass of wine, if taken *immediately* after the fatigue is induced upon the body, excites a fever: hence the frequency of fevers in persons upon their return from hunting, surveying, long rides, or from a camp life.

But how shall we account for the production of fever from the measles and small-pox, which attack so uniformly, and without predisposing debility from any of its causes which have been enumerated? I answer, that the contagions of those diseases seldom act so as to produce fever, until the system is first depressed. This is obvious from their being preceded by languor, and all the other symptoms formerly mentioned, which constitute the forming state of fever. The miasmata which induce the plague and

yellow fever, when they are not preceded by the usual debilitating and predisposing causes, generally induce the same depression of the system, previously to their exciting fever. Even wounds, and other local irritants, seldom induce fever before they have first produced the symptoms of depression formerly mentioned. I shall presently mention the exceptions to this mode of producing fever from contagious miasmata and local injuries, and show that they do not militate against the truth of the general proposition that has been delivered.

* It may serve still further to throw light upon this part of our subject, to take notice of the difference between the action of stimuli upon the body predisposed by debility and excitability to fever, and their action upon it when there is no such predisposition to fever.

In health there is a constant and just proportion between the degrees of excitement and excitability, and the force of stimuli. But this is not the case in a predisposition to a fever. The ratio between the action of stimuli and excitement, and excitability, is destroyed; and hence the former acts upon the latter with a force which produces irregular action, or a convulsion in the arterial system. When the body is debilitated, and its excitability increased, either by fear, darkness, or silence, a sudden noise occasions a short convulsion. We awake, in like manner, in a light convulsion, from the sudden opening of a door, or from the sprinkling of a few drops of water in the face, after the excitability of the system has been accumulated by a night's sleep. In a word, it seems to be a law of the system, that stimulus, in an over-proportion to excitability, either produces convulsion, or goes so far beyond it, as to destroy motion altogether in death.

V. There is but one exciting cause of fever, and that is stimulus. Heat, alternating with cold,* marsh and human miasmata, contagions and poisons of all kinds, intemperance, passions of the mind, bruises, burns, and the like, all act by a stimulating power only, in producing fever. This proposition is of great application, inasmuch as it cuts the

* Perhaps there is no greater enemy to the life of man than cold. Dr. Sydenham ascribes nearly all fevers to it, particularly to leaving off winter clothes too soon, and to exposing the body to cold after it has been heated. These sources of fever, he adds, destroy more than the plague, sword, or famine.—*Wallis's edition*, vol. i. p. 357.

sinews of the division of diseases from their remote causes. Thus it establishes the sameness of a pleurisy, whether it be excited by heat succeeding cold, or by the contagions of the small-pox and measles, or by the miasmata of the yellow fever.

To this proposition there is a seeming objection. Cold, sleep, immoderate evacuations, and the debilitating passions of grief and fear (all of which abstract excitement) appear to induce fever without the interposition of a stimulus. In all these cases, the *sudden* abstraction of excitement destroys the equilibrium of the system, by which means the blood is distributed unequally, and by acting with an increase of *quantity* and *force* in parts not accustomed to either, becomes an irritant to the blood-vessels, and thus a stimulating and exciting cause of fever. When it is induced by cold alone, it is probable so much of the perspirable matter may be retained as to co-operate, by its irritating qualities, in exciting the fever.

VI. There is but one fever. However different the pre-disposing, remote, or exciting causes of fever may be, whether debility from abstraction or action, whether heat or cold succeeding each other, whether marsh or human miasmata, whether intemperance, a fright, or a fall, still I repeat, there can be but one fever. I found this proposition upon all the supposed variety of fevers having but one proximate cause. Thus fire is a unit, whether it be produced by friction, percussion, electricity, fermentation, or by a piece of wood or coal in a state of inflammation. I infer the unity of fever further, from the sameness of the products or effects of all its different forms.

VII. All ordinary fever being seated in the blood-vessels, it follows, of course, that all those local affections we call pleurisy, angina, phrenitis, internal dropsy of the brain, pulmonary consumption, and inflammation of the liver, stomach, bowels, and limbs, are symptoms only of an original and primary disease in the sanguiferous system. The truth of this proposition is obvious, from the above local affections succeeding primary fever, and from their alternating so frequently with each other. I except from this remark those cases of primary affections of the viscera which are produced by local injuries, and which, after a while, bring the whole sanguiferous system into sympathy.

These cases are uncommon, amounting, probably, to not more than one in a hundred of all the cases of local affection which occur in general fever.

In my fourth proposition, I have called the action of the arteries *irregular* in fever, to distinguish it from that excess of action which takes place after violent exercise, and from that quickness which accompanies fear or any other directly debilitating cause. The action of the arteries here is *regular*, and, when felt in the pulse, affords a very different sensation from that *jerking* which we feel in the pulse of a patient labouring under a fever.

In my lectures upon pathology, in which I have maintained the unity of disease, I have said that it appears in one or more of the following primary forms. 1. Spasm, 2. Convulsion, 3. Heat, 4. Itching, 5. Aura dolorifica, and 6. Suffocated excitement. In ordinary fever, the second form of morbid excitement, that is, convulsion, takes place in the blood-vessels. That this is the case I infer from the strict analogy between symptoms of fever, and convulsions in the nervous system. I shall briefly mention the particulars in which this analogy takes place.

1. Are convulsions in the nervous system preceded by debility? So is the convulsion of the blood-vessels in fever.

2. Does debility, induced on the whole or on a part only of the nervous system, predispose to general convulsions, as in tetanus? So we observe debility, whether it be induced on the whole or on a part of the arterial system, predisposes to general fever. This is obvious in the fever which ensues alike from cold applied to every part of the body, or from a stream of cold air falling upon the neck, or from the wetting of the feet.

3. Do tremours precede convulsions in the nervous system? So they do the convulsion of the blood-vessels in fever.

4. Is a coldness in the extremities a precursor of convulsions in the nervous system? So it is of fever.

5. Do convulsions in the nervous system impart a jerking sensation to the fingers? So does the convulsion of fever in the arteries, when felt at the wrists.

6. Are convulsions in the nervous system attended with alternate action and remission? So is the convulsion of fever.

7. Do convulsions in the nervous system return at regular and irregular periods? So does fever.

8. Do convulsions in the nervous system, under certain circumstances, affect the functions of the brain? So do certain states of fever.

9. Are there certain convulsions in the nervous system which affect the limbs, without affecting the functions of the brain, such as tetanus, and chorea sancti viti? So there are certain fevers, particularly the common hectic, which seldom produce delirium, or even head-ach, and frequently do not confine a patient to his bed.

10. Are there local convulsions in the nervous system, as in the hands, feet, neck, and eye-lids? So there are local fevers. Intermittents often appear in the autumn, with periodical heat and pains in the eyes, ears, jaws, and back.

11. Are there certain grades in the convulsions of the nervous system, as appear in the hydrophobia, tetanus, epilepsy, hysteria, and hypocondriasis? So there are grades in fevers, as in the plague, yellow fever, small-pox, rheumatism, and common remitting and intermitting fevers.

12. Are nervous convulsions most apt to occur in infancy? So are fevers.

13. Are persons once affected with nervous convulsions frequently subject to them through life? So are persons once affected with fever. The intermitting fever often returns with successive springs or autumns, and, in spite of the bark, sometimes continues for many years, in all climates and seasons.

14. Is the strength of the nervous system increased by convulsions? This is so evident, that it often requires four or five persons to confine a delicate woman to her bed, in a convulsive fit. In like manner the strength of the arterial system is increased in a fever. This strength is great in proportion to the weakness of every other part of the body.

15. Do we observe certain nervous convulsions to affect some part of the nervous system more than others, or, in other words, do we observe preternatural strength or excitement to exist in one part of the nervous system, while other parts of the same system exhibit marks of preternatural weakness or defect of excitement? We observe the same thing in the blood-vessels in a fever. The pulse at the wrist is often *tense*, while the force of the heart is very

much diminished. A delirium often occurs, in a fever, from excess of excitement in the blood-vessels of the brain, while the pulse at the wrist exhibits every mark of preternatural weakness.

16. Is there a rigidity of the muscles in certain nervous diseases, as in catalepsy? Something like this solstice in convulsion occurs in that state of fever in which the pulse beats but sixty, or fewer strokes in a minute.

17. Do convulsions go off *gradually* from the nervous system, as in tetanus, and chorea sancti viti? So they do from the arterial blood-vessels in certain states of fever.

18. Do convulsions go off *suddenly* in any cases from the nervous system? The convulsion in the blood-vessels goes off in the same manner by a sweat, or by a hæmorrhage, frequently in the course of a night, and sometimes in a single hour.

19. Does palsy in some instances succeed to convulsions in the nervous system? Something like a palsy occurs in fevers of great inflammatory action in the arteries. They are often inactive in the wrists, and in other parts of the body, from the immense pressure of the remote cause of the fever upon them.

From the facts and analogies which have been mentioned, I have been led to conclude that the common forms of fever are occasioned simply by irregular action, or convulsion in the blood-vessels. This irregular action is of two kinds. The first is seated in the muscular fibres of the blood-vessels themselves; the second consists in an irregular distribution of the blood to different parts of the body, particularly to the brain, lungs, liver and spleen.

The history of the phenomena of fever, as delivered in the foregoing pages, resolves itself into a chain, consisting of the five following links.

1. Debility from action, or the abstraction of stimuli. When this debility is induced by action, it is sometimes preceded by elevated excitement in the blood-vessels, from the first impressions of stimuli upon them.

2. An increase of their excitability.

3. Stimulating powers applied to them.

4. Depression. And,

5. Irregular action or convulsion.

The whole of the links of this chain are perceptible only

when the fever comes on in a *gradual* manner. But I wish the reader to remember, that the same remote cause is often debilitating, stimulating, and depressing; and that, in certain fevers, the remote cause sometimes excites convulsions in the blood-vessels, without being preceded by preternatural debility and excitability, and with but little or no depression of the system. This has often been observed in persons who have been suddenly exposed to those marsh and human miasmata which produce malignant fevers. It sometimes takes place likewise in fevers induced by local injuries. The blood-vessels in these cases are, as it were, taken by storm, instead of regular approaches.

I might digress here, and show that all diseases, whether they be seated in the arteries, muscles, nerves, brain, or alimentary canal, are all preceded by debility; and that their essence consists in irregular action, or in the absence of the natural order of motion, produced or invited by predisposing debility. I might further show, that all the moral, as well as physical evil of the world consists in predisposing weakness, and in subsequent derangement of action or motion; but these collateral subjects are foreign to our present inquiry.

Let us now proceed to examine how far the facts which have been delivered accord with the phenomena of fever.

I shall divide these phenomena into two kinds.

I. Such as are transient, and more or less common to all fevers. These I shall call *symptoms* of fever.

II. Such as, being more permanent and fixed, have given rise to certain specific names. These I shall call *states* of fever.

I shall endeavour to explain and describe each of them, in the order in which they have been mentioned.

I. Lassitude is the effect of the depression of the whole system, which precedes fever.

The same cause, when it acts upon the extremities of the blood-vessels, produces coldness and chills. This is obvious to any person, under the first impression of the miasmata which bring on fevers, also under the influence of fatigue, and debilitating passions of the mind. The absence of chills indicates the sensibility of the external parts of the body to be suspended or destroyed, as well as their irritability; hence when death occurs in the fit of an

intermittent, there is no chill. A chilly fit, for the same reason, seldom occurs in the most malignant cases of fever.

It is sometimes excited by blood-letting, only because it weakens those fevers to such a degree, as to carry the blood-vessels back to the grade of depression. Coldness and chills are likewise removed by blood-letting, only because it enables the arteries to re-act in such a manner as to overcome the depression that induced it. It has been remarked, that the chilly fit, in common fevers, seldom appears in its full force until the patient approaches a fire, or lies down on a warm bed ; for in these situations, sensibility is restored by the stimulus of the heat acting upon the extremities of the blood-vessels. The first impressions of the rays of the sun, in like manner, often produce coldness and chills in the torpid bodies of old and weakly people.

Yawning and stretching are induced by a disposition in the system to overcome the uneasiness which arises from the contraction of the fauces, trachea, œsophagus and skin.

Tremours are the natural consequence of the abstraction of that support which the muscles receive from the fulness and tension of the blood-vessels. It is from this retreat of the blood towards the viscera, that the capillary arteries lose their fulness and tension ; hence they contract, like other soft tubes that are emptied of their contents. This contraction has been called a spasm, and has improperly been supposed to be the proximate cause of fever. From the explanation that has been given of its cause, it appears, like the coldness and chills, to be nothing but an accidental concomitant, or effect of a paroxysm of fever.

The local pains in the head, breast, and bones in fever, appear to be the effects of the irregular determination of the blood to those parts, and to morbid action being thereby induced in them.

The want of appetite and costiveness are the consequences of a defect of secretion of the gastric juice, and the abstraction of excitement or natural action from the stomach and bowels.

The inability to rise out of bed, and to walk, is the effect of the abstraction of excitement from the muscles of the lower limbs.

The dry skin or partial sweats appear to depend upon

diminished or partial action in the vessels which terminate on the surface of the body.

The high-coloured and pale urine are occasioned by an excess or a deficiency of excitement in the secretory vessels of the kidneys.

The suppression of the urine seems to arise from what Dr. Clark calls an engorgement, or choaking of the vessels of the kidneys. It occurs most frequently in malignant fevers.

Thirst is probably the effect of a preternatural excitement of the vessels of the fauces. It is by no means a uniform symptom of fever. We sometimes observe it, in the highest degree, in the last stage of diseases, induced by the retreat of the last remains of excitement from every part of the body to the throat.

The white tongue is produced by a change in the secretion which takes place in that organ. Its yellow colour is the effect of bile; its dryness is occasioned by an obstruction of secretion, or by the want of action in the absorbents; and its dark and black colour by a tendency to mortification.

It will be difficult to account for the variety in the degrees and locality of *heat* in the body in a fever, until we know more of the cause of animal heat. From whatever cause it be derived, its excess and deficiency, as well as all its intermediate degrees, are intimately connected with more or less excitement in the arterial system. It is not necessary that this excitement should exist only in the large blood-vessels. It will be sufficient for the purpose of creating great heat, if it occur only in the cutaneous vessels; hence we find a hot skin in some cases of malignant fever in which there is an absence of pulse. It is a singular fact, that when the heat of the body is 12° and 13° above its natural temperature, patients have sometimes a sensation of cold. This is taken notice of by Dr. De Haen and Dr. Haller. It is a fact likewise, that the body is sometimes cold, without the patient being sensible of it. The sensation of cold is said by Dr. Grimaud to be different in different forms of fever. In catarrh, and quotidian and quartan fevers, the sensation he says is the same as that of cold air applied to the body; while in tertian and bilious fevers, the sensation resembles that which is excited by sharp

points being thrust into the skin. Is there an increase in the quantity of heat in the whole body in a fever? Or is it, like excitement, only distributed unequally? Experiments alone can determine this question.

Eruptions seem to depend upon effusions of serum, lymph, or red blood upon the skin, with or without inflammation, in the cutaneous vessels.

I decline taking notice in this place of the symptoms which are produced by the debility from action and abstraction, and by the depression of the system. They appear not only in the temperature of the body, but in all the different symptoms of fever. It is of importance to know when they originate from the former, and when from the latter causes, as they sometimes require very different and opposite remedies to remove them.

It remains only to explain the cause why excess in the force or frequency of the action of the blood-vessels should succeed debility in a part, or in the whole of the body, and be connected for days and weeks with depression and preternatural debility in the nerves, brain, muscles, and alimentary canal. I shall attempt the explanation of this phenomenon by directing the attention of the reader to the operations of nature in other parts of her works.

1. A calm may be considered as a state of debility in the atmosphere. It predisposes to a current of air. But is this current proportioned to the loss of the equilibrium of the air? By no means. It is excessive in its force, and tends thereby to destroy the works both of nature and art.

2. The passions are given to man on purpose to aid the slow and uncertain operations of reason. But is their action always proportioned to the causes which excite them? An acute pneumony, brought on by the trifling injury done to the system by the fatigue and heat of an evening spent in a dancing assembly, is but a faint representation of the immense disproportion between a trifling affront, and that excess of passion which seeks for gratification in poison, assassination, or a duel. The same disproportion appears between cause and effect in public bodies. A hasty word, of no mischievous influence, has often produced convulsions, and even revolutions, in states and empires.

If we return to the human body we shall find in it many other instances of the disproportion between stimulus and

action, besides that which takes place in the excitement of fever.

3. A single castor oil nut, although rejected by the stomach upon its first effort in vomiting, has, in one instance that came within my knowledge, produced a vomiting that continued nearly four and twenty hours. Here the duration of action was far beyond all kind of proportion to the cause which excited it.

4. A grain of sand, after being washed from the eye, is often followed by such an inflammation or excess in the action of the vessels of the eye, as to require bleeding, purging, and blistering to remove it.

Could we comprehend every part of the sublime and ineffable system of the divine government, I am sure we should discover nothing in it but what tended ultimately to order. But the natural, moral, and political world exhibit every where marks of disorder, and the instruments of this disorder, are the operations of nature. Her influence is most obvious in the production of diseases, and in her hurtful or ineffectual efforts to remove them.* In again glancing at this subject I wish it to be remembered that those operations were not originally the means of injuring or seducing man, and that I believe a time will come when the exact relation between cause and effect, or, in other words, the dominion of order shall be restored over every action of his body and mind, and health and happiness again be the result of every movement of nature.

From the view I have given of the state of the blood-vessels in fever, the reader will perceive the difference between my opinions and Dr. Brown's upon this subject. The doctor supposes a fever to consist in debility. I do not admit debility to be a disease, but place it wholly in morbid excitement, invited and fixed by previous debility. He makes a fever to consist in a change only of a *natural* action of blood-vessels. I maintain that it consists in a *preternatural* and convulsive action of the blood-vessels. Lastly, Dr. Brown supposes excitement and excitability to be *equally* diffused over the whole body, but in unhealthy proportions to each other. My theory places fever in excitement and excitability *unequally* diffused, manifesting

* See the comparative View of the Diseases of the Indians and of Civilized Nations. Vol. I.

themselves, at the *same time*, in morbid actions, depression, and debility from abstraction, in different parts of the body. No new excitement from without is infused into the system by the irritants which excite a fever. They only destroy its equal and natural distribution; for while the arteries are in a plus, the muscles, stomach, and bowels are in a minus state of excitement, and the business of medicine is to equalize it in the cure of fever, that is, to abstract its excess from the blood-vessels, and to restore it to the other parts of the body.

II. I come now to apply what has been delivered to the explanation and description of the different phenomena or states of fever.

I have said in my sixth proposition that there is but one fever. Of course I do not admit of its artificial division into genera and species. A disease which so frequently changes its form and place, should never have been designated, like plants and animals, by unchangeable characters. The oak tree and the lion possess exactly the same properties which they did nearly 6000 years ago. But who can say the same thing of any one disease? The pulmonary consumption is sometimes transformed into a head-ach, rheumatism, diarrhœa, and mania, in the course of two or three months, or the same number of weeks. The bilious fever often appears in the same person in the form of colic, dysentery, inflammation of the liver, lungs, and brain, in the course of five or six days. The hypochondriasis and the hysteria seldom fail to exchange their symptoms twice in the four and twenty hours. Again: the oak tree has not united with any of the trees of the forest, nor has the lion imparted his specific qualities to any other animal. But who can apply similar remarks to any one disease? Phrenitis, gastritis, enteritis, nephritis, and rheumatism all appear at the same time in the gout and yellow fever. Many observations of the same kind might be made, to show the disposition of nearly all other diseases to anastomose with each other. To describe them therefore by any fixed or specific characters is as impracticable as to measure the dimensions of a cloud on a windy day, or to fix the component parts of water by weighing it in a hydrostatic balance. Much mischief has been done by nosological arrangements of diseases. They erect imaginary boundaries between

things which are of a homogeneous nature. They degrade the human understanding, by substituting simple perceptions to its more dignified operations in judgment and reasoning. They gratify indolence in a physician, by fixing his attention upon the name of a disease, and thereby leading him to neglect the varying state of the system. They moreover lay a foundation for disputes among physicians, by diverting their attention from the simple, predisposing, and proximate, to the numerous, remote, and exciting causes of diseases, or to their more numerous, and complicated effects. The whole *materia medica* is infected with the baneful consequences of the nomenclature of diseases, for every article in it is pointed only against their names, and hence the origin of the numerous contradictions among authors who describe the virtues and doses of the same medicines. By the rejection of the artificial arrangement of diseases, a revolution must follow in medicine. Observation and judgment will take the place of reading and memory, and prescriptions will be conformed to existing circumstances. The road to knowledge in medicine by this means will likewise be shortened; so that a young man will be able to qualify himself to practice physic at as much less expense of time and labour than formerly, as a child would learn to read and write by the help of the Roman alphabet, instead of Chinese characters.

In thus rejecting the nosologies of the schools, I do not wish to see them banished from the libraries of physicians. When consulted as histories of the effects of diseases only, they may still be useful. I use the term diseases, in conformity to custom, for, properly speaking, disease is as much a unit as fever. It consists simply of morbid action or excitement in some part of the body. Its different seats and degrees should no more be multiplied into different diseases, than the numerous and different effects of heat and light upon our globe should be multiplied into a plurality of suns.

The advocates for Dr. Cullen's system of medicine, will not, I hope, be offended by these observations. His immense stock of reputation will enable him to sustain the loss of his nosology without being impoverished by it. In my attempts to introduce a new arrangement of fevers, I

shall only give a new direction to his efforts to improve the healing art.

Were it compatible with the subject of the present inquiry, it would be easy to show, that the same difficulties and evils are to be expected from Dr. Darwin's division of diseases, as they affect the organs of sensation and motion, and as they are said to be exclusively related by association and volition, that have been deprecated from their divisions and subdivisions by the nosologists. Diseases, like vices, with a few exceptions, are necessarily undisciplined and irregular. Even the genius of Dr. Darwin has not been able to compel them to move within lines.

I return from this digression to remark, that morbid action in the blood-vessels, whether it consist in preternatural force and frequency, or preternatural force without frequency, or frequency without force, constitutes fever. Excess in the force and frequency in the pulsations of the arteries have been considered as the characteristic marks of what is called inflammatory fever. There are, however, symptoms which indicate a much greater excess of irritating impressions upon the blood-vessels. These are preternatural slowness, intermissions, and depression in the pulse, such as occur in certain malignant fevers.

But there is a grade of fever, which transcends in force that which produces inflammation. It occurs frequently in hydrophobia, dysentery, colic, and, baron Humboldt lately informed me, upon the authority of Dr. Comoto, of Vera Cruz, in the yellow fever of that city, when it proves fatal in a few hours after it attacks. In vain have physicians sought to discover, by dissections, the cause of fever in those cases, when followed by death, in the parts of the body in which it was supposed, from pain and other symptoms, to be principally seated. Those parts have frequently exhibited no marks of inflammation, nor of the least deviation from a healthy state. I have ascribed this apparent absence of disease to the serous vessels being too highly excited, and thereby too much contracted, to admit the entrance of red blood into them. I wish these remarks to be remembered by the student of medicine. They have delivered me from the influence of several errors in pathology; and they are capable, if properly extended and applied, of

leading to many important deductions in the practice of physic.

I shall now briefly mention the usual effects of fever, or morbid excitement in the blood-vessels, when not removed by medicine. They are,

1. Inflammation. It is produced by an effusion of red particles of blood into serous vessels, constituting what Dr. Boerhaave calls *error loci*. It is the second grade of fever, and, in fevers of great violence, does not take place until morbid excitement has continued for some time, or has been reduced by bleeding.

2. Secretion, or an effusion from rupture, of the serum of the blood, constituting dropsies. Under this head I include hydatids, which are found in every part of the body, even in the heart.

3. Secretion of lymph or fibrin, forming a membrane which adheres to certain surfaces in the body.

4. Secretion of pus, sloughs, and of a black matter, in the stomach, liver, bowels, kidneys, and upon the skin. In the stomach it is called the "black vomit:" upon the skin it forms what are called carbuncles.

5. An effusion by rupture, or a congestion of all the component parts of the blood.

6. Gangrene from the death of the blood-vessels.

7. Rupture of blood-vessels, producing hæmorrhage.

8. Redness, phlegmon, pustules, and petechiæ on the skin, and tubercles in the lungs, and on the liver and bowels.

9. Air. How far this product of diseased action in the blood-vessels may extend to every part of the body, I know not. There can be no doubt of its being effused from the stomach and liver into the bowels, in the paroxysms of bilious fevers.

10. Schirrus, cartilage and bone.

11. Calcareous and other earthy matters. The two last take place only in the feeble and often imperceptible grades of morbid action in the blood-vessels. Different parts of the body are more or less disposed to produce the different products of fever that have been mentioned.

12. Death. This arises from the following causes.

1. Sudden destruction of the excitability of the blood-vessels.

2. A disorganization of parts immediately necessary to life.

3. A change in the fluids, so as to render them destructive to what are called the vital organs.

4. Debility, from the exhausted or suspended state of the excitability of the blood-vessels.

All these effects of fever are different according to its grade. Dr. Blane says fevers are rarely inflammatory in the West-Indies; that is, they pass rapidly from simple morbid excitement to congestion, hæmorrhage, gangrene, and death. This remark is confirmed by Dr. Dalzelle, who says the pneumony in the negroes in the French West-India islands, rarely appears in any other form than that of the notha, from the arteries in the lungs being too much stimulated to produce common inflammation; but such is the force of morbid excitement in hot climates, that it sometimes passes suddenly over all its intermediate effects, and discovers itself only in death. This appears to have taken place in the cases at Vera Cruz, mentioned by baron Humboldt. The two extremes of morbid excitement seem to meet in a point, for we sometimes observe death to take place from a feeble typhus fever without leaving behind it any marks of inflammation or even serous effusion, in common with the violent grade of fever which has been described.

All the different states of fever may be divided,

I. Into such as affect the whole arterial system; but with no, or very little local disease.

II. Into such as affect the whole arterial system, and are accompanied at the same time with evident local disease.

III. Into such as appear to pass by the arterial system, and to fix themselves upon other parts of the body. I shall call these states of fever *misplaced*.

I. To the first class of the states of fever belong,

1. The *malignant*. It constitutes the highest or worst grade of morbid diathesis. It is known by attacking frequently without a chilly fit, by coma, a depressed, slow, or intermitting pulse, and sometimes by the absence of pain, and with a natural temperature or coldness of the skin. It occurs in the plague, in the yellow fever, in the gout, in the small-pox and measles, in the hydrophobia, and after taking opium and other stimulating substances.

Dr. Quier has described a pleurisy in Jamaica, in which some of those malignant symptoms took place. They are the effect of such a degree of impression as to prostrate the arterial system, and to produce a defect of action from an excess of force. Such is this excess of force, in some instances, in this state of fever, that it induces general convulsions, tetanus, and palsy, and sometimes extinguishes life in a few hours by means of apoplexy or syncope. From its being accompanied with these symptoms, it has received the name of *adynamique* by Dr. Alibert. The less violent degrees of stimulus in this state of fever produce palsy in the blood-vessels. It probably begins in the veins, and extends gradually to the arteries. It seems further to begin in the extremities of the arteries, and to extend by degrees to their origin in the heart. This is evident in the total absence of pulse which sometimes takes place in malignant fevers, four and twenty, and even eight and forty hours before death. But there are cases in which this palsy affects both the veins and arteries at the same time. It is probable from this simultaneous affection of the blood-vessels, that the arteries are found to be nearly full of blood after death from malignant fevers. The depressing and intermitting pulse which occurs in the beginning of these fevers perhaps depends upon a tendency to palsy in the arteries, independently of an affection of the heart or brain.

This *prostrate* state of fever more frequently when left to itself terminates in petechiæ, buboes, carbuncles, abscesses, and mortifications, according as serum, lymph, or red blood is effused in the viscera or external parts of the body. These morbid appearances have been ascribed to putrefaction, and the fever has received, from its supposed presence, the name of putrid. The existence of putrefaction in the blood in a fever is rendered improbable.

1. By Dr. Seybert's experiments,* which prove that it does not take place in the blood in a living state. It occurs in the excretions of bile, fæces, and urine, but in this case it does not act as a ferment, but a stimulus only upon the living body.

2. By similar appearances, with those which have been

* Inaugural dissertation, entitled, "An Attempt to disprove the Putrefaction of the Blood in Living Animals."

ascribed to putrefaction, having been produced by lightning, by violent emotions of the mind, by extreme pain, and by every thing else which induces sudden and universal disorganization in the fluids and solids of the body. The following facts clearly prove that the symptoms which have been supposed to designate a putrid fever, are wholly the effect of mechanical action in the blood-vessels, and are unconnected with the introduction of a putrid ferment in the blood.

Hippocrates relates the case of a certain Antiphillus, in whom a putrid bilious fever (as he calls it) was brought on by the application of a caustic to a wound.*

An acute pain in the eye, Dr. Physick informed me, produced the symptoms of what is called a putrid fever, which terminated in death in five days, in St. George's hospital, in the year 1789.

Dr. Baynard relates, upon the authority of a colonel Bampffield, that a stag, which he had chased for some time, stopped at a brook of water, in order to drink. Soon afterwards, it fell and expired. The colonel cut its throat, and was surprised to perceive the blood which issued from it had a putrid and offensive smell.†

Dr. Desportes takes notice that a fish, which he calls a sucker, affected the system nearly in the same manner as the miasmata of the yellow fever. A distressing vomiting, a coldness of the extremities, and an absence of pulse, were some of the symptoms produced by it; and an inflammation and mortification of the stomach and bowels, were discovered, after death, to be the effects of its violent operation.

Even opium, in large doses, sometimes produces, by its powerful stimulus, the same symptoms which are produced by the stimulus of marsh miasmata. These symptoms are a slow pulse, coma, a vomiting, cold sweats, a sallow colour of the face, and a suppression of the discharges by the urinary passages and bowels.

Error is often perpetuated by words. A belief in the putrefaction of the blood has done great mischief in medicine. The evil is kept up, under the influence of new theories, by the epithet putrid, which is still applied to fever,

* Epidemics, book iv.

† Treatise on the Cold Bath.

in all our medical books. For which reason I shall reject it altogether, and substitute in its room—

2. The *gangrenous* state of fever; for what appear to some physicians to be signs of putrefaction, are nothing but the issue of a violent inflammation left in the hands of nature, or accelerated by stimulating medicines. Thus the sun, when viewed at mid-day, appears to the naked eye, from the excess of its splendour, to be a mass of darkness, instead of an orb of light.

The same explanation of what are called putrid symptoms in fever, is very happily delivered by Mr. Hunter, in the following words: “It is to be observed (says this acute physiologist) that when the attack upon these organs, which are principally connected with life, proves fatal, that the effects of the inflammation upon the constitution run through all the stages with more rapidity than when it happens in other parts; so that at its very beginning, it has the same effect upon the constitution which is only produced by the second stage of inflammation in other parts.”*

3. The *synochus fortis* state of fever is known by a full, quick, and round pulse, without tension. The autumnal bilious fever and colic, also the gout, often appear in this form.

4. The *synocha*, or the common inflammatory state of fever, attacks suddenly with chills, and is succeeded by a quick, frequent, and tense pulse, great heat, thirst, and pains in the bones, joints, breasts, or sides. These symptoms sometimes occur in the plague, the jail and yellow fever, and the small-pox; but they are the more common characteristics of pleurisy, gout, and rheumatism. They now and then occur in the influenza, the measles, and the puerperile fever.

5. There is a state of fever in which the pulse is small, but tense and quick. The patient, in this state of fever, is seldom confined to his bed. We observe it sometimes in the chronic rheumatism, and in pulmonary consumption. The inflammatory state of this grade of fever is proved from the inefficacy of the volatile tincture of guaiacum and other stimulants to remove it, and from its yielding so suddenly to blood-letting. I have called it the *synochula* state of fever.

* Treatise on Inflammation, chap. I §

6. There is a state of fever inclining more to the synocha, than what is called the typhus, or low chronic state of fever. I have called it the *synochoid* state of fever.

7. The *synochus mitis*, or mild bilious, and intermitting states of fever.

8. The *typhus* state of fever is generally preceded by all those circumstances which debilitate the system, both by the action and abstraction of stimuli. It is known by a weak and frequent pulse, a disposition to sleep, a torpor of the alimentary canal, tremours of the hands, a dry tongue, and, in some instances, by a diarrhœa. These symptoms occur most frequently in what is called the jail, the ship, and the hospital fever. I heard of it in a few cases in the yellow fever of 1793; and all writers take notice of cases of the plague, which run on into a slow fever that continues 30 or 40 days. I have seen it succeed the common bilious fever, pleurisy, and influenza. It has been confounded with the malignant state of fever, or what is called the typhus gravior; but it differs widely from it in being accompanied for the most part by a feeble excitement in the blood-vessels from a feeble stimulus, and by the usual signs of debility from abstraction in every other part of the body.

From the accession of new stimuli, or an increase in the force of former ones, this typhus state of fever sometimes assumes, on the 11th, 14th, and even 20th days, the symptoms of the synocha state of fever. It will be useful to remember this remark, not only because it establishes the unity of fever, but because it will justify the use of a remedy, seldom prescribed after the disease has acquired that name which associates it with stimulating medicines.

The common name of this state of fever, is the *nervous* fever. This name is improper; for it invades the nervous system by pain, delirium, and convulsions, much less than several other states of fever. To prevent the absurd and often fatal association of ideas upon the treatment of this state of fever, I have called it, from its duration, the *low chronic* state of fever. I have adopted the term *low*, from Dr. Butter's account of the remitting fever of children, in order to distinguish it from states of fever to be mentioned hereafter, in which the patient is not confined to his bed. This new name of the typhus or nervous fever establishes its analogy with several other diseases. We have the acute

and the chronic rheumatism; the acute and chronic pneumonia, commonly called the pleurisy and pulmonary consumption; the acute and chronic inflammation of the brain, known unfortunately by the unrelated names of phrenitis, madness, and internal dropsy of the brain. Why should we hesitate, in like manner, in admitting acute and chronic fever, in all those cases where no local inflammation attends?

9. The *typhoid* state of fever is composed of the synocha and low chronic states of fever. It is the *slow* nervous fever of Dr. Butter. The excitement of the blood-vessels is somewhat greater than in the *low* chronic state of fever. Perhaps the muscular fibres of the blood-vessels, in this state of fever, are affected by different degrees of stimulus and excitement. Supposing a pulse to consist of eight cords, I think I have frequently felt more or less of them tense or relaxed, according as the fever partook more or less of the synocha, or low chronic states of fever. This state of fever occurs most frequently in what are called the hectic and puerperal fevers, and in the scarlatina.

10. The *hectic* state of fever differs from all the other states of fever, by the want of regularity in its paroxysms, in which chills, fevers, and sweats are included; and by the brain, nerves, muscles, and alimentary canal being but little impaired in their functions by it. It appears to be an exclusive disease of the blood-vessels. It occurs in the pulmonary consumption, in some cases of lues, of scrofula, and of the gout, and after most of the states of fever which have been described. The force of the pulse is various, being occasionally synochoid, typhoid, and typhus.

11. Intermissions, or the *intermitting* and remitting states of fever, are common to all the states of fever which have been mentioned. But they occur most distinctly and universally in those which partake of the bilious diathesis. They have been ascribed to the reproduction of bile, to the recurrence of debility, and to the influence of the heavenly bodies upon the system. None of these hypotheses has explained the recurrence of fever, where the bile has not been in fault, where debility is uniform, and where the paroxysms of fever do not accord with the revolutions of any part of the solar system. I have endeavoured to account for the recurrence of the paroxysm of fever, in common

with all other periodical diseases, by means of a natural or adventitious association of motions. Dr. Percival has glanced at this law of animal matter; and Dr. Darwin has explained by it, in the most ingenious manner, many natural and morbid actions in the human body.

12. There is a state of fever in which the morbid action of the blood-vessels is so feeble as scarcely to be perceptible. Like the hectic state of fever, it seldom affects the brain, nerves, muscles, or alimentary canal. It is known in the southern states of America by the name of *inward* fevers. The English physicians formerly described it by the name of *febricula*.

These twelve states of fever may be considered as *primary* in their nature. All the states which remain to be enumerated belong to some one of them, or they are compounds of two, three, or more of them. Even these primary states of fever seldom appear in the simple form in which they have been described. They often blend their symptoms; and sometimes all the states appear at different times in the course of a fever. This departure from a uniformity in the character of fevers must be sought for in the changes of the weather, in the casual application of fresh irritants, or in the operation of the remedies which have been employed to cure them.

To the first class of the states of fever belong the sweating, the fainting, the burning, and the cold and chilly states of fever.

13. The *sweating* state of fever occurs in the plague, in the yellow fever, in the small-pox, the pleurisy, the rheumatism, and in the hectic and intermitting states of fever. Profuse sweats appeared every other day in the autumnal fever of 1795 in Philadelphia, without any other symptom of an intermittent. The English sweating sickness was nothing but a symptom of the plague. The sweats in all these cases are the effects of morbid and excessive action, concentrated in the capillary vessels.

14. The *fainting* state of fever accompanies the plague, the yellow fever, the small-pox, and some states of pleurisy. It is the effect of great depression; hence it occurs most frequently in the beginning of those states of fever.

15. The *burning* state of fever has given rise to what has been called a species of fever. It is the causus of au-

thors. Dr. Mosely, who rejects the epithet of yellow, when applied to the bilious fever, because it is only one of its accidental symptoms, very improperly distinguishes the same fever by another symptom, viz. the burning heat of the skin, and which is not more universal than the yellowness which attends it.

16. The *cold* and *chilly* state of fever differs from a common chilly fit, by continuing four or five days, and to such a degree, that the patient frequently cannot bear his arms out of the bed. The coldness is most obstinate in the hands and feet. A *coolness* only of the skin attends in some cases, which is frequently mistaken for an absence of fever.

In mentioning those states of fever which affect the arterial system without any, or with but little local disease, I wish to be understood that they do not affect that system only. On the contrary, they bring the nerves, muscles, lymphatics, and brain more or less into sympathy with it. The last suffers most from those fevers which are derived from miasmata, and contagions, in consequence of their passing directly in most cases, from the nose to the brain. I proceed next to enumerate those states of fever which belong to the—

II. Class of the order that was mentioned, in which there are local affections combined with general fever. They are—

17. The *intestinal* state of fever. I have been anticipated in giving this epithet to fever, by Dr. Balfour.* It includes the cholera morbus, diarrhœa, dysentery, and colic. The remitting bilious fever appears, in all the above forms, in the summer months. They all belong to the febris introversa of Dr. Sydenham. The jail fever appears likewise frequently in the form of diarrhœa and dysentery. The dysentery is the offspring of marsh and human miasmata, but it is often induced in a weak state of the bowels, by other exciting causes. The colic occasionally occurs with states of fever to be mentioned hereafter.

18. The *pulmonary* state of fever includes the true and bastard pneumony in their acute forms; also catarrh from cold and influenza, and the chronic form of pneumony in what is called pulmonary consumption.

19. The *eruptive* state of fever includes the small-pox,

* Account of the Intestinal Remitting Fever of Bengal.

measles, erysipelas, military fever, chicken-pox, and pemphigus.

20. The *anginose* state of fever includes all those affections of the throat which are known by the names of cynanche inflammatoria, tonsillaris, parotidea, maligna, scarlatina, and trachealis. The cynanche trachealis is a febrile disease. The membrane which produces suffocation and death in the wind-pipe is the effect of inflammation. It is said to be formed, like other membranes which succeed inflammation, from the coagulable lymph of the blood.

21. The *rheumatic* state of fever is confined chiefly to the labouring part of mankind. The topical affection is seated most commonly in the joints and muscles, which, from being exercised more than other parts of the body, become more debilitated, and are, in consequence thereof, excited into morbid and inflammatory action.

22. The *arthritic* or *gouty* state of fever differs from the rheumatic, in affecting, with the joints and muscles, all the nervous and lymphatic systems, the viscera, and the skin. Its predisposing, exciting, and proximate causes are the same as the rheumatic and other states of fever. It bears the same ratio to rheumatism, which the yellow fever bears to the common bilious fever. It is a fever of more force than rheumatism.

23. The *cephalic*, in which are included the phrenitic, lethargic, apoplectic, paralytic, hydrocephalic, and maniacal states of fever. That madness is originally a state of fever, I infer, 1. From its causes, many of which are the same as those which induce all the other states of fever. 2. From its symptoms, particularly a full, tense, quick, and sometimes a slow pulse. 3. From the inflammatory appearances of the blood which has been drawn to relieve it. And, 4. From the phenomena exhibited by dissection in the brains of maniacs, being the same as are exhibited by other inflamed viscera after death. These are, effusions of water or blood, abscesses, and schirrus. The hardness in the brains of maniacs, taken notice of by several authors, is nothing but a schirrus (*sui generis*), induced by the neglect of sufficient evacuations in this state of fever. The reader will perceive by these observations, that I reject madness from its supposed primary seat in the mind or nerves. It is as much an original disease of the blood-

vessels, as any other state of fever. It is to phrenitis, what pulmonary consumption is to pneumony. The derangement in the operations of the mind is the effect only of a chronic inflammation of the brain, existing without an abstraction of muscular excitement.

24. The *nephritic* state of fever, is often induced by calculi, but it frequently occurs in the gout, small-pox, and malignant states of fever. There is such an engorgement, or choaking of the vessels of the kidneys, that the secretion of the urine is sometimes totally obstructed, so that the bladder yields no water to the catheter. It is generally accompanied with a full or tense pulse, great pain, sickness, or vomiting, high coloured urine, and a pain along the thigh and leg, with occasionally a retraction of one of the testicles. It exists sometimes without any pain. Of this I met with several instances in the yellow fever of 1793. I include diabetes in this state of fever.

25. The *hydropic* state of fever, in which are included collections of water, in the lungs, cavity of the thorax, cavity of the abdomen, ovaria, scrotum, testicles, and lower extremities, and usually preceded, and generally accompanied with morbid action in the blood-vessels. That dropsy is a state of fever, I have endeavoured to prove in another place.* Nineteen dropsies out of twenty appear to be original arterial diseases, and the water, which has been supposed to be their cause, is as much the effect of preternatural and morbid action in the blood-vessels, as pus, gangrene, and schirrus are of previous inflammation. This has been demonstrated, by the late Dr. Cooper, in a man who died of an ascites in the Pennsylvania hospital. Pus and blood, as well as water, were found in the cavity of the abdomen. It is no objection to this theory of dropsy, that we sometimes find water in the cavities of the body after death, without any marks of inflammation in the contiguous blood-vessels. We often find pus, both in the living and dead body, under the same circumstances, where we are sure it was not preceded by any of the obvious marks of inflammation.

26. The *hæmorrhagic* state of fever, in which are included discharges of blood from the nose, lungs, stomach, liver, bowels, kidneys, and bladder, hæmorrhoidal vessels,

* On Dropsies, Vol. II.

and skin. Hæmorrhages have been divided into active and passive. It would be more proper to divide them, like other states of general fever, into hæmorrhages of strong and feeble morbid action. There is seldom an issue of blood from a vessel, in which there does not exist preternatural or accumulated excitement. We observe this hæmorrhagic state of fever most frequently in malignant fevers, in pulmonary consumption, in pregnancy, and in that period of life in which the menses cease to be regular.

27. The *amenorrhagic* state of fever occurs more frequently than is suspected by physicians. A full and quick pulse, head-ach, thirst, and preternatural heat often accompany a chronic obstruction of the menses. The inefficacy, and even hurtful effects, of what are called emenagogue medicines, in this state of the system, without previous depletion, show the propriety of introducing it among the different states of fever.

I have designedly omitted to take notice of other states of general fever accompanied with local disease, because they are most frequently combined with some one or more of those which have been mentioned. They may all be seen in Dr. Cullen's Synopsis, with their supposed respective generic characters, under the class of pyrexia, and the order of fevers. We now come, in the—

III. And last place, to mention the *misplaced* states of fever. The term is not a new one in medicine. The gout is said to be misplaced, when it passes from the feet to the viscera. The periodical pains in the head, eyes, ears, jaws, hips, and back, which occur in the sickly autumnal months, and which impart no fulness, force, nor frequency to the pulse, are all misplaced fevers. There are, besides these, many other local morbid affections, which are less suspected of belonging to febrile diseases. The nature of these states of fever may be understood, by recollecting one of the laws of sensation, that is, that certain impressions, which excite neither sensation nor motion in the part of the body to which they are applied, excite both in another part. Thus worms, which are not felt in the stomach or bowels, often produce a troublesome sensation in the throat; and a stone, which is attended with no pain in the bladder, produces a troublesome itching in the glans penis.

In like manner, the irritants which produce fever in ordinary cases pass through the blood-vessels, and convey their usual morbid effects into a remote part of the body, which has been prepared to receive them by previous debility. That this is the case, I infer further, from fevers being called back from their misplaced or suffocated situations, by creating an artificial debility in the arteries by the abstraction of blood. This is often done in muscular convulsions, and in several diseases of the brain.

Under this class of fevers are included—

28. The *chronic hepatic* state of fever. The causes, symptoms, and remedies of the liver disease of the East Indies, as mentioned by Dr. Girdlestone, all prove that it is nothing but a bilious fever translated from the blood-vessels, and absorbed, or suffocated, as it were, in the liver. This view of the chronic hepatitis is important, inasmuch as it leads to the liberal use of all the remedies which cure bilious fever. Gall stones and contusions now and then produce a hepatitis; but under no other circumstances do I believe it ever exists, but as a symptom of general or latent fever.

29. The hæmorrhoids are frequently a local disease, but they are sometimes accompanied with pain, giddiness, chills, and an active pulse. When these symptoms occur, it should be considered as a *hæmorrhoidal* state of fever.

30. The ophthalmia, when it occurs, as it frequently does in sickly seasons, with a quick and tense pulse, and pains diffused over the whole head, may properly be called an *ophthalmic* state of fever.

31. The tooth-ach, and—

32. Ear-ach, when they arise from colds, and are attended with great heat, a quick and tense pulse, and pains in the head, are *odontalgic* and *otalgic* states of fever.

33. The aphthæ, from the pain and fever which attend them, are justly entitled to the name of the *apthous* state of fever.

34. The symptoms of scrofula, as described by Dr. Handy, in his treatise on the glandular disease of Barbadoes, clearly prove it to be a *misplaced* state of fever.

35. The scurvy has lately been proved by Dr. Claiborne, in his inaugural dissertation, published in the year 1797, to arise from so many of the causes, and to possess so

many of the symptoms, of the low chronic and petechial states of fever, that I see no impropriety in considering it as a state of fever.

36. The *convulsive* or *spasmodic* state of fever. Convulsions, it is well known, often usher in fevers, more especially in children. But the connexion between spasmodic affections and fever, in adults, has been less attended to by physicians. The same causes which produced general fever and hepatitis in the East Indies, in some soldiers, produced locked jaw in others. Several of the symptoms of this disease, as described by Dr. Girdlestone, such as coldness on the surface of the body, cold sweats on the hands and feet, intense thirst, a white tongue, incessant vomitings, and carbuncles, all belong to the malignant state of fever.* By means of blood-letting, and the other remedies for the violent state of bilious fever, I have seen the convulsions in this disease translated from the muscles to the blood-vessels, where they immediately produced *all* the common symptoms of fever.

37. The *hysterical* and *hypochondriacal* states of fever. The former is known by a rising in the throat, which is for the most part erroneously ascribed to worms, by pale urine, and by a disposition to shed tears, or to laugh upon trifling occasions. The latter discovers itself by false opinions of the nature and danger of the disease under which the patient labours. Both these states of the nervous system occur frequently in the gout, and in the malignant state of fever. It is common to say, in such cases, that patients have a complication of diseases; but this is not true, for the hysterical and hypochondriacal symptoms are nothing but the effects of one remote cause, concentrating its force chiefly upon the nerves and muscles.

38. The *cutaneous* state of fever. Dr. Sydenham calls a dysentery a “*febris introversa*.”—Eruptions of the skin are often nothing but the reverse of this introverted fever. They are a fever translated to the skin; hence we find them most common in those countries and seasons in which fevers are epidemic. The prickly heat, the rash, and the esserc of authors, are all states of misplaced fever. “Agues, fevers, and even *pleurisies*, (says Mr. Townsend, in his Journey through Spain,†) are said often to terminate in

* Essay on the Spasmodic Affections in India, p. 53, 54, 55.

† Vol. II. Dublin edition, p. 262

scabies, and this frequently gives place to them, returning, however, when the fever ceases. In adults, it takes possession of the hands and arms, with the legs and thighs, covering them with a filthy crust." Small biles are common among the children in Philadelphia, at the time the cholera infantum makes its appearance. These children always escape the summer epidemic. The elephantiasis described by Dr. Hillary, in his account of the diseases of Barbadoes, is evidently a translation of an intermittent to one of the limbs. It is remarkable, that the leprosy and malignant fevers of all kinds have appeared and declined together in the same ages and countries. But further, petechiæ sometimes appear on the skin without fever. Cases of this kind, with and without hæmorrhages, are taken notice of by Riverius,* Dr. Duncan, and many other practical writers. They are cotemporary or subsequent to fevers of a malignant complexion. They occur likewise in the scurvy. From some of the predisposing, remote, and exciting causes of this disease, and from its symptoms and remedies, I have suspected it, like the petechiæ mentioned by Riverius, to be originally a fever generated by human miasmata, in a misplaced state. The hæmorrhages which sometimes accompany the scurvy, certainly arise from a morbid state of the blood-vessels. The heat and quick pulse of fever are probably absent, only because the preternatural excitement of the whole sanguiferous system is confined to those extreme or cutaneous vessels which pour forth blood. In like manner the fever of the small-pox deserts the blood-vessels, as soon as a new action begins on the skin. Or perhaps the excitability of the larger blood-vessels may be so far exhausted by the long or forcible impression of the remote and predisposing causes of the scurvy, as to be incapable of undergoing the convulsive action of general fever.

With this I close the history of the phenomena of fever. It is imperfect from its brevity, as well as from other causes. I commit it to my pupils, to be corrected and improved.

"We think our fathers fools, so wise we grow,
 "Our wiser sons, *I hope*, will think us so."

* Praxis Medica, lib. xviii. cap. i.

AN ACCOUNT
OF THE
BILIOUS REMITTING YELLOW FEVER,
AS IT
APPEARED IN PHILADELPHIA,
IN THE YEAR 1793.

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OF

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OF

OF

AN ACCOUNT, &c.

BEFORE I proceed to deliver the history of this fever, it will be proper to give a short account of the diseases which preceded it.

The state of the weather during the first seven months of the year, and during the time in which the fever prevailed in the city, as recorded by Mr. Rittenhouse, will be inserted immediately after the history of the disease.

The *mumps*, which made their appearance in December, 1792, continued to prevail during the month of January, 1793. Besides this disease, there were many cases of catarrh in the city, brought on chiefly by the inhabitants exposing themselves for several hours on the damp ground, in viewing the aerial voyage of Mr. Blanchard, on the 9th day of the month.

The weather, which had been moderate in December and January, became cold in February. The mumps continued to prevail during this month with symptoms so inflammatory as to require, in some cases, two bleedings. Many people complained this month of pains and swellings in the jaws. A few had the scarlatina anginosa.

The mumps, pains in the jaws, and scarlatina continued throughout the month of March. I was called to two cases of pleurisy in this month, which terminated in a temporary mania. One of them was a woman of ninety years of age, who recovered. The blood drawn in the other case (a gentleman from Maryland) was dissolved. The continuance of a tense pulse induced me, notwithstanding, to repeat the bleeding. The blood was now sizzly. A third bleeding was prescribed, and my patient recovered. Several cases of obstinate erysipelas succeeded inoculation in children during this and the next month, one of which proved fatal.

Blossoms were universal on the fruit-trees, in the gardens of Philadelphia, on the first day of April. The scarlatina

anginosa continued to be the reigning epidemic in this month.

There were several warm days in May, but the city was in general healthy. The birds appeared two weeks sooner this spring than usual.

The register of the weather shows that there were many warm days in June. The scarlatina continued to maintain its empire during this month.

The weather was uniformly warm in July. The scarlatina continued during the beginning of this month, with symptoms of great violence. A son of James Sharswood, aged seven years, had, with the common symptoms of this disease, great pains and swellings in his limbs, accompanied with a tense pulse. I attempted in vain to relieve him by vomits and purges. On the 10th day of the month, I ordered six ounces of blood to be drawn from his arm, which I observed afterwards to be very sizzly. The next day he was nearly well. Between the 22d and the 24th days of the month, there died three persons, whose respective ages were 80, 92, and 96¹. The weather at this time was extremely warm. I have elsewhere taken notice of the fatal influence of extreme heat, as well as cold, upon human life in old people. A few bilious remitting fevers appeared towards the close of this month. One of them under my care ended in a typhus or chronic fever, from which the patient was recovered with great difficulty. It was the son of Dr. Hutchins, of the island of Barbadoes.

The weather, for the first two or three weeks in August, was temperate and pleasant. The cholera morbus and remitting fevers were now common. The latter were attended with some inflammatory action in the pulse, and a determination to the breast. Several dysenteries appeared at this time, both in the city and in its neighbourhood. During the latter part of July, and the beginning of this month a number of the distressed inhabitants of St. Domingo, who had escaped the desolation of fire and sword, arrived in the city. Soon after their arrival, the influenza made its appearance, and spread rapidly among our citizens. The scarlatina still kept up a feeble existence among children. The above diseases were universal, but they were not attended with much mortality. They prevailed in different parts of the city, and each appeared occasionally to be the

ruling epidemic. The weather continued to be warm and dry. There was a heavy rain on the twenty-fifth of the month, which was remembered by the citizens of Philadelphia, as the last that fell for many weeks afterwards.

There was something in the heat and drought of the summer months which was uncommon, in their influence upon the human body. Labourers every where gave out (to use the country phrase) in harvest, and frequently too when the mercury in Fahrenheit's thermometer was under 84°. It was ascribed by the country people to the calmness of the weather, which left the sweat produced by heat and labour to dry slowly upon the body.

The crops of grain and grass were impaired by the drought. The summer fruits were as plentiful as usual, particularly the melons, which were of an excellent quality. The influence of the weather upon the autumnal fruits, and upon vegetation in general shall be mentioned hereafter.

I now enter upon a detail of some solitary cases of the epidemic, which soon afterwards spread distress through our city, and terror throughout the United States.

On the 5th of August, I was requested by Dr. Hodge to visit his child. I found it ill with a fever of a bilious kind, which terminated (with a yellow skin) in death on the 7th of the same month.

On the 6th of August, I was called to Mrs. Bradford, the wife of Mr. Thomas Bradford. She had all the symptoms of a bilious remittent, but they were so acute as to require two bleedings, and several successive doses of physic. The last purge she took was a dose of calomel, which operated plentifully. For several days after her recovery, her eyes and face were of a yellow colour.

On the same day, I was called to the son of Mrs. M'Nair, who had been seized violently with all the usual symptoms of a bilious fever. I purged him plentifully with salts and cream of tartar, and took ten or twelve ounces of blood from his arm. His symptoms appeared to yield to these remedies; but on the 10th of the month an hæmorrhage from the nose came on, and on the morning of the 12th he died.

On the 7th of this month I was called to visit Richard Palmer, a son of Mrs. Palmer, in Chesnut-street. He had been indisposed for several days with a sick stomach, and vomiting after eating. He now complained of a fever and

head-ach. I gave him the usual remedies for the bilious fever, and he recovered in a few days. On the 15th day of the same month I was sent for to visit his brother William, who was seized with all the symptoms of the same disease. On the 5th day his head-ach became extremely acute, and his pulse fell to sixty strokes in a minute. I suspected congestion to have taken place in his brain, and ordered him to lose eight ounces of blood. His pulse became more frequent, and less tense after bleeding, and he recovered a day or two afterwards.

On the 14th day of this month I was sent for to visit Mrs. Leaming, the wife of Mr. Thomas Leaming. I suspected at first that she had the influenza, but in a day or two her fever put on bilious symptoms. She was affected with an uncommon disposition to faint. Her pulse was languid, but *tense*. I took a few ounces of blood from her, and purged her with salts and calomel. I afterwards gave her a small dose of laudanum which disagreed with her. In my note book I find I have recorded that "she was worse for it." I was led to make this remark by its being so very uncommon for a person, who had been properly bled and purged, to take laudanum in a common bilious fever without being benefited by it. She recovered, however, slowly, and was yellow for many days afterwards.

On the morning of the 18th of this month I was requested to visit Peter Aston, in Vine-street, in consultation with Dr. Say. I found him on the third day of a most acute bilious fever. His eyes were inflamed, and his face flushed with a deep red colour. His pulse seemed to forbid evacuations. We prescribed the strongest cordials, but to no purpose. We found him, at 6 o'clock in the evening, sitting upon the side of his bed, perfectly sensible, but without a pulse, with cold clammy hands, and his face of a yellowish colour. He died a few hours after we left him.

None of the cases which I have mentioned excited the least apprehension of the existence of a malignant or yellow fever in our city; for I had frequently seen sporadic cases in which the common bilious fever of Philadelphia had put on symptoms of great malignity, and terminated fatally in a few days, and now and then with a yellow colour on the skin, before or immediately after death.

On the 19th of this month I was requested to visit the

wife of Mr. Peter Le Maigre, in Water-street, between Arch and Race-streets, in consultation with Dr. Foulke and Dr. Hodge. I found her in the last stage of a highly bilious fever. She vomited constantly, and complained of great heat and burning in her stomach. The most powerful cordials and tonics were prescribed, but to no purpose. She died on the evening of the next day.

Upon coming out of Mrs. Le Maigre's room I remarked to Dr. Foulke and Dr. Hodge, that I had seen an unusual number of bilious fevers, accompanied with symptoms of uncommon malignity, and that I suspected all was not right in our city. Dr. Hodge immediately replied, that a fever of a most malignant kind had carried off four or five persons within sight of Mr. Le Maigre's door, and that one of them had died in twelve hours after the attack of the disease. This information satisfied me that my apprehensions were well founded. The origin of this fever was discovered to me at the same time, from the account which Dr. Foulke gave me of a quantity of damaged coffee which had been thrown upon Mr. Ball's wharf, and in the adjoining dock, on the 24th of July, nearly in a line with Mr. Le Maigre's house, and which had putrified there to the great annoyance of the whole neighbourhood.

After this consultation I was soon able to trace all the cases of fever which I have mentioned to this course. Dr. Hodge lived a few doors above Mr. Le Maigre's, where his child had been exposed to the exhalation from the coffee for several days. Mrs. Bradford had spent an afternoon in a house directly opposite to the wharf and dock on which the putrid coffee had emitted its noxious effluvia, a few days before her sickness, and had been much incommoded by it. Her sister, Mrs. Leaming, had visited her during her illness at her house, which was about two hundred yards from the infected wharf. Young Mr. M'Nair and Mrs. Palmer's two sons had spent whole days in a counting house near where the coffee was exposed, and each of them had complained of having been made sick by its offensive smell, and Mr. Aston had frequently been in Water-street near the source of the exhalation.

This discovery of the malignity, extent, and origin of a fever which I knew to be attended with great danger and mortality, gave me great pain. I did not hesitate to name

it the *bilious remitting yellow fever*. I had once seen it epidemic in Philadelphia, in the year 1762. Its symptoms were among the first impressions which diseases made upon my mind. I had recorded some of these symptoms, as well as its mortality. I shall here introduce a short account of it, from a note book which I kept during my apprenticeship.

“In the year 1762, in the months of August, September, October, November, and December, the bilious yellow fever prevailed in Philadelphia, after a *very hot summer*, and spread like a plague, carrying off daily, for some time, upwards of twenty persons.

“The patients were generally seized with rigours, which were succeeded with a violent fever, and pains in the head and back. The pulse was full, and sometimes irregular. The eyes were inflamed, and had a yellowish cast, and a vomiting almost always attended.

“The 3d, 5th, and 7th days were mostly critical, and the disease generally terminated on one of them, in life or death.

“An eruption on the 3d or 7th day over the body proved salutary.

“An excessive heat and burning about the region of the liver, with cold extremities, portended death to be at hand.”

I have taken notice, in my note book, of the principal remedy which was prescribed in this fever by my preceptor in medicine, but this shall be mentioned hereafter.

Upon my leaving Mrs. Le Maigre's, I expressed my distress at what I had discovered, to several of my fellow-citizens. The report of a malignant and mortal fever being in town spread in every direction, but it did not gain universal credit. Some of those physicians who had not seen patients in it denied that any such fever existed, and asserted (though its mortality was not denied) that it was nothing but the common annual remittent of the city. Many of the citizens joined the physicians in endeavouring to discredit the account I had given of this fever, and for a while it was treated with ridicule or contempt. Indignation in some instances was excited against me, and one of my friends, whom I advised in this early stage of the disease to leave the city, has since told me that for that advice “he had hated me.”

My lot in having thus disturbed the repose of the public mind, upon the subject of general health, was not a singular one. There are many instances upon record, of physicians who have rendered themselves unpopular, and even odious to their fellow-citizens, by giving the first notice of the existence of malignant and mortal diseases. A physician who asserted that the plague was in Messina, in the year 1743, excited so much rage in the minds of his fellow-citizens against him, as to render it necessary for him to save his life by retreating to one of the churches of that city.

In spite, however, of all opposition, the report of the existence of a malignant fever in the city gained so much ground, that the governor of the state directed Dr. Hutchinson, the inspector of sickly vessels, to inquire into the truth of it, and into the nature of the disease.

In consequence of this order, the doctor wrote letters to several of the physicians in the city, requesting information relative to the fever. To his letter to me, dated the 24th of August, I replied on the same day, and mentioned not only the existence of a malignant fever, but the streets it occupied, and my belief of its being derived from a quantity of coffee which had putrified on a wharf near Arch-street. This, and other information collected by the doctor, was communicated to the health officer, in a letter dated the 27th of August, in which he mentioned the parts of the city where the disease prevailed, and the number of persons who had died of it, supposed by him to be about 40, but which subsequent inquiries proved to be more than 150. He mentioned further, in addition to the damaged coffee, some putrid hides, and other putrid animal and vegetable substances, as the supposed cause of the fever, and concluded by saying, as he had not heard of any foreigners or sailors being infected, nor of its being found in any lodging-houses, that "it was not an imported disease."

In the mean while the disease continued to spread, and with a degree of mortality that had never been known from common fevers.

On the 25th of the month, the college of physicians was summoned by their president to meet, in order to consult about the best methods of checking the progress of the

fever in the city. After some consideration upon the nature of the disease, a committee was appointed to draw up some directions for those purposes; and the next day the following were presented to the college, and adopted unanimously by them. They were afterwards published in most of the newspapers.

Philadelphia, August 26th, 1793.

The college of physicians having taken into consideration the malignant and contagious fever that now prevails in this city, have agreed to recommend to their fellow-citizens the following means of preventing its progress.

1st. That all unnecessary intercourse should be avoided with such persons as are infected by it.

2d. To place a mark upon the door or window of such houses as have any infected persons in it.

3d. To place the persons infected in the centre of large and airy rooms, in beds without curtains, and to pay the strictest regard to cleanliness, by frequently changing their body and bed linen, also by removing, as speedily as possible, all offensive matters from their rooms.

4th. To provide a large and airy hospital, in the neighbourhood of the city, for the reception of such poor persons as cannot be accommodated with the above advantages in private houses.

5th. To put a stop to the tolling of the bells.

6th. To bury such persons as die of this fever in carriages, and in as private a manner as possible.

7th. To keep the streets and wharves of the city as clean as possible. As the contagion of the disease may be taken into the body, and pass out of it without producing the fever, unless it be rendered active by some occasional cause, the following means should be attended to, to prevent the contagion being excited into action in the body.

8th. To avoid all fatigue of body and mind.

9th. To avoid *standing* or *sitting* in the sun; also in a current of air, or in the evening air.

10th. To accommodate the dress to the weather, and to exceed rather in warm, than in cool clothing.

11th. To avoid intemperance, but to use fermented liquors, such as wine, beer, and cyder, in moderation.

The college conceive *fires* to be very ineffectual, if not

dangerous means of checking the progress of this fever. They have reason to place more dependence upon the burning of *gunpowder*. The benefits of *vinegar* and *camphor* are confined chiefly to infected rooms, and they cannot be used too frequently upon handkerchiefs, or in smelling-bottles, by persons whose duty calls to visit or attend the sick.

Signed by order of the college,

WILLIAM SHIPPEN, jun.

Vice president.

SAMUEL P. GRIFFITTS,

Secretary.

From a conviction that the disease originated in the putrid exhalations from the damaged coffee, I published in the American Daily Advertiser, of August 29th, a short address to the citizens of Philadelphia, with a view of directing the public attention to the spot where the coffee lay, and thereby of checking the progress of the fever as far as it was continued by the original cause.

This address had no other effect than to produce fresh clamours against the author; for the citizens, as well as most of the physicians of Philadelphia, had adopted a traditional opinion that the yellow fever could exist among us only by importation from the West-Indies.

In consequence, however, of a letter, from Dr. Foulke to the mayor of the city, in which he had decided, in a positive manner, in favour of the generation of the fever from the putrid coffee, the mayor gave orders for the removal of the coffee, and the cleaning of the wharf and dock. It was said that measures were taken for this purpose; but Dr. Foulke, who visited the place where the coffee lay, repeatedly assured me, that they were so far from being effectual, that an offensive smell was exhaled from it many days afterwards.

I shall pass over, for the present, the facts and arguments on which I ground my assertion of the generation of this fever in our city. They will come in more properly in the close of the history of the disease.

The seeds of the fever, when received into the body, were generally excited into action in a few days. I met

with several cases in which they acted so as to produce a fever on the same day in which they were received into the system, and I heard of two cases in which they excited sickness, fainting, and fever within one hour after the persons were exposed to them. I met with no instance in which there was a longer interval than sixteen days between their being received into the body and the production of the disease.

This poison acted differently in different constitutions, according to previous habits, to the degrees of predisposing debility, or to the quantity and concentration of the miasmata which had been received into the body.

In some constitutions, the miasmata were at once a remote, a predisposing, and an exciting cause of the disease; hence some persons were affected by them, who had not departed in any instance from their ordinary habits of living, as to diet, dress, and exercisc. But it was more frequently brought on by those causes acting in succession to each other.

I shall here refer the reader to the principles laid down in the outlines of the phenomena of fever, for an account of the manner in which the system was predisposed to this disease, by the debility induced by the reduction of its excitement, by action and abstraction, and by subsequent depression. Where a predisposition was thus produced, the fever was excited by the following causes, acting directly or indirectly upon the system. Where this predisposition did not exist, the exciting causes produced both the predisposition and the disease. They were,

1. *Great labour*, or exercise of body or mind, in walking, riding, watching, or the like. It was labour which excited the disease so universally among the lower class of people. A long walk often induced it. Few escaped it after a day, or even a few hours spent in gunning. A hard trotting horse brought it upon two of my patients. Perhaps riding on horseback, and in the sun, was the exciting cause of the disease in most of the citizens and strangers who were affected by it in their flight from the city. A fall excited it in a girl, and a stroke upon the head excited it in a young man who came under my care. Many people were seized with the disease in consequence of their exertions on the night of the 7th of September, in extin-

guishing the fire which consumed Mr. Dobson's printing-office, and even the less violent exercise of working the fire engines, for the purpose of laying the dust in the streets, added frequently to the number of the sick.

2. *Heat*, from every cause, but more especially the heat of the sun, was a very common exciting cause of the disease. The register of the weather during the latter end of August, the whole of September, and the first two weeks in October, will show how much the heat of the sun must have contributed to excite the disease, more especially among labouring people. The heat of common fires likewise became a frequent cause of the activity of the miasmata, where they had been received into the body; hence the greater mortality of the disease among bakers, blacksmiths, and hatters than among any other class of people.

3. *Intemperance* in eating or drinking. A plentiful meal, and a few extra glasses of wine seldom failed of exciting the fever. But where the body was strongly impregnated with the seeds of the disease, even the smallest deviation from the customary stimulus of diet, in respect to quality or quantity, roused them into action. A supper of twelve oysters in one, and of but three in another, of my patients, produced the disease. Half an ounce of meat excited it in a lady who had lived, by my advice, for two weeks upon milk and vegetables, and even a supper of salad, dressed after the French fashion, excited it in one of Dr. Mease's patients.

4. *Fear*. In many people the disease was excited by a sudden paroxysm of fear; but I saw some remarkable instances where timid people escaped the disease, although they were constantly exposed to it. Perhaps a moderate degree of fear served to counteract the excessive stimulus of the miasmata, and thereby to preserve the body in a state of healthy equilibrium. I am certain that fear did no harm after the disease was formed, in those cases where great morbid excess of action had taken place. It was an early discovery of this fact which led me not to conceal from my patients the true name of this fever, when I was called to them on the *day* of their being attacked by it. The fear co-operated with some of my remedies (to be mentioned hereafter) in reducing the morbid excitement of the arterial system.

5. *Grief*. It was remarkable that the disease was not

excited in many cases in the attendants upon the sick, while there was a hope of their recovery. The grief which followed the extinction of hope, by death, frequently produced it within a day or two afterwards, and that not in one person only, but often in most of the near relations of the deceased. But the disease was also produced by a change in the state of the mind directly opposite to that which has been mentioned. Many persons that attended patients who recovered, were seized with the disease a day or two after they were relieved from the toils and anxiety of nursing. The collapse of the mind from the abstraction of the stimulus of hope and desire, by their ample gratification, probably produced that debility, and loss of the equilibrium in the system, which favoured the activity of the miasmata in the manner formerly mentioned.*

The effects of both the states of mind which have been described, have been happily illustrated by two facts which are recorded by Dr. Jackson.† He tells us, that the garrisons of Savannah and York-town were both healthy during the siege of those towns, but that the former became sickly as soon as the French and American armies retreated from before it, and the latter, immediately after its capitulation.

6. *Cold.* Its action, in exciting the disease, depended upon the diminution of the necessary and natural heat of the body, and thereby so far destroying the equilibrium of the system, as to enable the miasmata to produce excessive or convulsive motions in the blood-vessels. The night air, even in the warm month of September, was often so cool as to excite the disease, where the dress and bed-clothes were not accommodated to it. It was excited in one case by a person's only wetting his feet, in the month of October, and neglecting afterwards to change his shoes and stockings. Every change in the weather, that was less than that which produces frost, evidently increased the number of sick people. This was obvious after the 18th and 19th of September, when the mercury fell to 44° and 45° . The hopes of the city received a severe disappointment upon this occasion, for I well recollect there was a general expectation that this change in the weather would have checked the disease. The same increase of the number of sick was

* Outlines of the phenomena of fever.

† Treatise on the Fevers of Jamaica, p. 298.

observed to follow the cool weather which succeeded the 6th and 7th of October, on which days the mercury fell to 43° and 46° .

It was observed that those persons who were *habitually* exposed to the cool air, were less liable to the disease than others. I ascribe it to the *habitual* impression of the cool night air upon the bodies of the city watchmen, that but four or five of them, out of twenty-five, were affected by the disease.

After the body had been heated by violent exercise, a breeze of cool air sometimes excited the disease in those cases where there had been no change in the temperature of the weather.

7. *Sleep.* A great proportion of all who were affected by this fever, were attacked in the night. Sleep induced what I have called debility from abstraction, and thereby disposed the miasmata which floated in the blood, to act with such force upon the system as to destroy its equilibrium, and thus to excite a fever. The influence of sleep, as a predisposing and exciting cause, was often assisted by the want of bed-clothes, suited to the midnight or morning coolness of the air.

8. *Immoderate evacuations.* The efficacy of moderate purging and bleeding in preventing the disease, led some people to use those remedies in an excess, which both predisposed to the disease, and excited it. The morbid effects of these evacuations, were much aided by fear, for it was this passion which perverted the judgment in such a manner, as to lead to the excessive use of remedies, which to be effectual, should only be used in moderate quantities.

The disease appeared with different symptoms, and in different degrees, in different people. They both varied likewise with the weather. In describing the disease, I shall take notice of the changes in the symptoms, which were produced by changes in the temperature of the air.

The precursors, or premonitory signs of this fever were, costiveness, a dull pain in the right side, defect of appetite, flatulency, perverted taste, heat in the stomach, giddiness, or pain in the head, a dull, watery, brilliant, yellow, or red eye, dim and imperfect vision, a hoarseness, or slight sore throat, low spirits, or unusual vivacity, a moisture on the hands, a disposition to sweat at nights, or after moderate.

exercise, or a sudden suppression of night sweats. The dull eye and the lowness of spirits, appeared to be the effects of such an excess in the stimulus of the miasmata as to induce depression, while the brilliant eye, and the unusual vivacity, seemed to have been produced by a less quantity of the miasmata acting as a cordial upon the system. More or less of these symptoms, frequently continued for two or three days before the patients were confined to their beds, and in some people they continued during the whole time of its prevalence in the city, without producing the disease. I wish these symptoms to be remembered by the reader. They will form the corner stone of a system which I hope will either eradicate the disease altogether, or render it as safe as an intermitting fever, or as the small-pox when it is received by inoculation.

Frequent as these precursors of the fever were, they were not universal. Many went to bed in good health, and awoke in the night with a chilly fit. Many rose in the morning after regular and natural sleep, and were seized at their work, or after a walk, with a sudden and unexpected attack of the fever. In most of these cases the disease came on with a chilly fit, which afforded by its violence or duration a tolerable presage of the issue of the disease.

Upon entering a sick room where a patient was confined by this fever, the first thing that struck the eye of a physician was the countenance. It was as much unlike that which is exhibited in the common bilious fever, as the face of a wild, is unlike the face of a mild domestic animal. The eyes were sad, watery, and so inflamed, in some cases, as to resemble two balls of fire. Sometimes they had a most brilliant or ferocious appearance. The face was suffused with blood, or of a dusky colour, and the whole countenance was downcast and clouded. After the 10th of September, when a determination of blood to the brain became universal, there was a preternatural dilatation of the pupil. Sighing attended in almost every case. The skin was dry, and frequently of its natural temperature. These were the principal symptoms which discovered themselves to the eye and hand of a physician. The answers to the first questions proposed upon visiting a patient, were calculated to produce a belief in the mind of a physician, that the disease under which the patient laboured was not

the prevailing malignant epidemic. I did not for many weeks meet with a dozen patients, who acknowledged that they had any other indisposition than a common cold, or a slight remitting or intermitting fever. I was particularly struck with this self-deception in many persons, who had nursed relations that had died with the yellow fever, and who had been exposed to it in neighbourhoods where it had prevailed for days and even weeks with great mortality. I shall hereafter trace a part of this disposition in the sick to deceive themselves, to the influence of certain publications, which appeared soon after the disease became epidemic in the city.

In the further history of this fever, I shall describe its symptoms as they appeared—

I. In the sanguiferous system.

II. In the liver, lungs, and brain.

III. In the alimentary canal; in which I include the stomach as well as the bowels.

IV. In the secretions and excretions.

V. In the nervous system.

VI. In the senses and appetites.

VII. In the lymphatic and glandular system.

VIII. Upon the skin.

IX. In the blood.

After having finished this detail, I shall mention some general characters of the disease, and afterwards subdivide it into classes, according to its degrees and duration.

I. The *blood-vessels* were affected more or less in every case of this fever. I have elsewhere said, that a fever is occasioned by a convulsion in the arterial system.* When the epidemic, which we are now considering, came on with a full, tense, and quick pulse, this convulsion was very perceptible; but it frequently came on with a weak pulse, often without any preternatural frequency or quickness, and sometimes so low as not to be perceived without pressing the artery at the wrists. In many cases the pulse intermitted after the fourth, in some after the fifth, and in others after the fourteenth stroke. These intermissions occurred in several persons who were infected, but who were not confined by the fever. They likewise continued in several of my patients for many days after their recovery. This

* Outlines of the phenomena of fever.

was the case in particular in Mrs. Clymer, Mrs. Palmer's son William, and in a son of Mr. William Compton. In some, there was a preternatural slowness of the pulse. It beat 44 strokes in a minute in Mr. B. W. Morris, 48 in Mr. Thomas Warton, jun. and 64 in Mr. William Sansom, at a time when they were in the most imminent danger. Dr. Physick informed me that in one of his patients the pulse was reduced in frequency to 30 strokes in a minute. All these different states of the pulse have been taken notice of by authors who have described pestilential fevers.* They have been improperly ascribed to the absence of fever: I would rather suppose that they are occasioned by the stimulus of the remote cause acting upon the arteries with too much force to admit of their being excited into quick and convulsive motions. The remedy which removed it (to be mentioned hereafter) will render this explanation of its cause still more probable. Milton describes a darkness from an excess of light. In like manner we observe, in this small, intermitting, and slow pulse, a deficiency of strength from an excess of force applied to it. In nearly every case of it which came under my notice, it was likewise tense or chorded. This species of pulse occurred chiefly in the month of August, and in the first ten days in September. I had met with it formerly in a sporadic case of yellow fever. It was new to all my pupils. One of them, Mr. Washington, gave it the name of the "undescribable pulse." It aided in determining the character of this fever before the common bilious remittent disappeared in the city. For awhile, I ascribed this peculiarity in the pulse, more especially its *slowness*, to an affection of the brain only, and suspected that it was produced by what I have taken the liberty elsewhere to call the *phrenicula*, or inflammatory state of the internal dropsy of the brain, and which I have remarked to be an occasional symptom and consequence of remitting fever.† I was the more disposed to adopt this opinion, from perceiving this slow, chorded, and intermitting pulse more frequently in children than in adults. Impressed with this idea, I requested Mr. Coxe, one of my pupils, to assist me

* Vergasca, Sorbait, and Boate in Haller's *Bibliotheca Medicinæ*, vol. iii. also by Dr. Stubbs in the *Philosophical Transactions*, and Riverius in his *Treatise de Febre Pestilenti*.

† Vol. ii.

in examining the state of the eyes. For two days we discovered no change in them, but on the third day after we began to inspect them, we both perceived a preternatural dilatation of the pupils, in different patients; and we seldom afterwards saw an eye in which it was absent. In Dr. Say it was attended by a squinting, a symptom which marks a high degree of a morbid affection of the brain. Had this slowness or intermission in the pulse occurred only after signs of inflammation or congestion had appeared in the brain, I should have supposed that it had been derived wholly from that cause; but I well recollect having felt it several days before I could discover the least change in the pupil of the eye. I am forced therefore to call in the operation of another cause, to assist in accounting for this state of the pulse, and this I take to be a spasmodic affection accompanied with preternatural dilatation or contraction of the heart. Lieutaud mentions this species of pulse in several places, as occurring with an undue enlargement of that muscle.* Dr. Ferriar describes a case, in which a low, irregular, intermitting, and hardly perceptible pulse attended a morbid dilatation of the heart.† In a letter I received from Mr. Hugh Furguson, then a student of medicine in the college of Edinburgh, written from Dublin, during the time of a visit to his father, and dated September 30th, 1793, I find a fact which throws additional light upon this subject. “A case (says my young correspondent) where a remarkable intermission of pulse was observed, occurred in this city last year. A gentleman of the medical profession, middle aged, of a delicate habit of body, and who had formerly suffered phthisical attacks, was attacked with the acute rheumatism. Some days after he was taken ill, he complained of uncommon fulness, and a very peculiar kind of sensation about the præcordia, which it was judged proper to relieve by copious blood-letting. This being done, the uneasiness went off. It returned, however, three or four times, and was as often relieved by bleeding. During each of his fits (if I may call them so), the patient experienced an almost total remission of his pains in his limbs; but they returned with equal or greater violence after blood-letting. During the fit there was an intermis-

* *Historia Anatomica Medica*, vol. ii. obs. 405, 418, 423, 510.

† *Medical Histories and Reflections*, p. 150.

sion of the pulse (the first time) of no less than thirteen strokes. It was when beating full, strong, and slow. The third intermission was of nine strokes. The gentleman soon recovered, and has enjoyed good health for ten months past. The opinion of some of his physicians was, that the heart was affected, as a muscle, by the rheumatism, and alternated with the limbs."

I am the more inclined to believe the peculiarity in the pulse, which has been mentioned in the yellow fever, arose in part from a spasmodic affection of the heart, from the frequency of an uncommon palpitation of this muscle, which I discovered in this disease, more especially in old people. The disposition, likewise, to syncope and sighing, which so often occurred, can be explained upon no other principle than inflammation, spasm, dilatation, or congestion in the heart. After the 10th of September this undescribable or *sulky* pulse (for by the latter epithet I sometimes called it) became less observable, and in proportion as the weather became cool, it totally disappeared. It was gradually succeeded by a pulse full, tense, quick, and as frequent as in pleurisy or rheumatism. It differed, however, from a pleuritic or rheumatic pulse, in imparting a very different sensation to the fingers. No two strokes seemed to be exactly alike. Its action was of a hobbling nature. It was at this time so familiar to me that I think I could have distinguished the disease by it without seeing the patient. It was remarkable that this pulse attended the yellow fever even when it appeared in the mild form of an intermittent, and in those cases where the patients were able to walk about or go abroad. It was nearly as *tense* in the remissions and intermissions of the fever as it was in the exacerbations. It was an alarming symptom, and when the only remedy which was effectual to remove it was neglected, such a change in the system was induced as frequently brought on death in a few days.

This change of the pulse, from extreme lowness to fulness and activity, appeared to be owing to the diminution of the heat of the weather, which by its stimulus, added to that of the remote cause, had induced those symptoms of depression of the pulse which have been mentioned.

The pulse most frequently lessened in its fulness, and became gradually weak, frequent, and imperceptible before

death, but I met with several cases in which it was full, active, and even tense in the last hours of life.

Hæmorrhages belong to the symptoms of this fever as they appeared in the sanguiferous system. They occurred in the beginning of the disease, chiefly from the nose and uterus. Sometimes but a few drops of blood distilled from the nose. The menses were unusual in their quantity when they appeared at their stated periods, but they often came on a week or two before the usual time of their appearance. I saw one case of an hæmorrhage from the lungs on the first day of the fever, which was supposed to be a common hæmoptysis. As the disease advanced the discharges of blood became more universal. They occurred from the gums, ears, stomach, bowels, and urinary passages. Drops of blood issued from the inner canthus of the left eye of Mr. Josiah Coates. Dr. Woodhouse attended a lady who bled from the holes in her ears which had been made by ear-rings. Many bled from the orifices which had been made by bleeding, several days after they appeared to have been healed, and some from wounds which had been made in veins in unsuccessful attempts to draw blood. These last hæmorrhages were very troublesome, and in some cases precipitated death.

II. I come now to mention the symptoms of this fever as they appeared in the *liver*, the *lungs*, and the *brain*. From the histories which I had read of this disease, I was early led to examine the state of the *liver*, but I was surprised to find so few marks of hepatic affection. I met with but two cases in which the patient could lie only on the right side. Many complained of a dull pain in the region of the liver, but very few complained in the beginning of the disease, of that soreness to the touch, about the pit of the stomach, which is taken notice of by authors, and which was universal in the yellow fever in 1762. In proportion as the cool weather advanced, a preternatural determination of the blood took place chiefly to the lungs and brain. Many were affected with pneumonic symptoms, and some appeared to die of sudden effusions of blood or serum in the lungs. It was an unexpected effusion of this kind which put an end to the life of Mrs. Kepple after she had exhibited hopeful signs of a recovery.

I saw one person who recovered from an affection of the

lungs, by means of a copious expectoration of yellow phlegm and mucus. But the *brain* was principally affected with morbid congestion in this disease. It was indicated by the suffusion of blood in the face, by the redness of the eyes, by a dilatation of the pupils, by the pain in the head, by the hæmorrhages from the nose and ears, by the sickness or vomiting, and by an almost universal costive state of the bowels. I wish to impress the reader with these facts, for they formed one of the strongest indications for the use of the remedies which I adopted for the cure of this disease. It is difficult to determine the exact state of these viscera in every case of bilious and yellow fever. Inflammation certainly takes place in some cases, and internal hæmorrhages in others; but I believe the most frequent affection of these viscera consists in a certain morbid accumulation of blood in them, which has been happily called, by Dr. Clark, an *engorgement* or choaking of the blood-vessels. I believe further, with Dr. Clark* and Dr. Balfour,† that death in most cases in bilious fevers is the effect of these morbid congestions, and wholly unconnected with an exhausted state of the system, or a supposed putrefaction in the fluids. It is true, the dissections of Dr. Physick and Dr. Cathrall (to be mentioned hereafter) discovered no morbid appearances in any of the viscera which have been mentioned, but it should be remembered, that these dissections were made early in the disease. Dr. Annan attended the dissection of a brain of a patient who died at Bush-hill some days afterwards, and observed the blood-vessels to be unusually turgid. In those cases where congestion only takes place, it is as easy to conceive that all morbid appearances in the brain may cease after death, as that the suffusion of blood in the face should disappear after the retreat of the blood from the extremities of the vessels, in the last moments of life. It is no new thing for morbid excitement of the brain to leave either slender, or no marks of disease after death. This, I have said, is often the case where it exceeds that degree of action which produces an effusion of red blood into serous vessels, or what is called inflammation.‡ Dr. Quin has given a dissection of the brain of a child that died with all the symptoms of hydrocephalus internus, and yet nothing was

* Vol. i. p. 168.

† Treatise on the Intestinal Remitting Fever, p. 125.

‡ Outlines of the phenomena of fever.

discovered in the brain but a slight turgescence of its blood-vessels. Dr. Girdlestone says, no injury appeared in the brains of those persons who died of the symptomatic apoplexy, which occurred in a spasmodic disease, which he describes, in the East-Indies; and Mr. Clark informs us, that the brain was in a natural state in every case of death from puerperile fever, notwithstanding it seemed to be affected in many cases soon after the attack of that disease.*

I wish it to be remembered here, that the yellow fever, like all other diseases, is influenced by climate and seasons. The determination of the fluids is seldom the same in different years, and I am sure it varied with the weather in the disease which I am now describing. Dr. Jackson speaks of the head being most affected in the West-India fevers in *dry* situations. Dr. Hillary says, that there was an unusual determination of the blood towards the brain, after a *hot* and *dry* season, in the fevers of Barbadoes in the year 1753; and Dr. Ferriar, in his account of an epidemic jail fever in Manchester, in 1789, 1790, informs us, that as soon as frost set in, a delirium became a more frequent symptom of that disease, than it had been in more temperate weather.

III. The *stomach* and *bowels* were affected in many ways in this fever. The disease seldom appeared without nausea or vomiting. In some cases they both occurred for several days or a week before they were accompanied by any fever. Sometimes a pain, known by the name of gastrodynia, ushered in the disease. The stomach was so extremely irritable as to reject drinks of every kind. Sometimes green or yellow bile was ejected on the first day of the disease by vomiting; but I much oftener saw it continue for two days without discharging any thing from the stomach, but the drinks which were taken by the patient. If the fever in any case came on without vomiting, or if it had been checked by remedies that were ineffectual to remove it altogether, it generally appeared, or returned, on the 4th or 5th day of the disease. I dreaded this symptom on those days, for although it was not always the forerunner of death, yet it generally rendered the recovery more difficult and tedious. In some cases the vomiting was more or less constant from the beginning to the end of the disease, whether it terminated in life or death.

* Essay on the Epidemic Diseases of Lying-in Women, of the years 1787 and 1788, p. 34

The vomiting which came on about the 4th or 5th day, was accompanied with a burning pain in the region of the stomach. It produced great anxiety, and tossing of the body from one part of the bed to another. In some cases, this painful burning occurred before any vomiting had taken place. Drinks were now rejected from the stomach so suddenly, as often to be discharged over the hand that lifted them to the head of the patient. The contents of the stomach (to be mentioned hereafter) were sometimes thrown up with a convulsive motion, that propelled them in a stream to a great distance, and in some cases all over the clothes of the by-standers.

Flatulency was an almost universal symptom, in every stage of this disease. It was very distressing in many cases. It occurred chiefly in the stomach.

The *bowels* were generally costive, and in some patients as obstinately so as in the dry gripes. In some cases there was all the pain and distress of a bilious colic, and in others, the tenesmus, and mucous and bloody discharges of a true dysentery. A diarrhœa introduced the disease in a few persons, but it was chiefly in those who had been previously indisposed with weak bowels. A painful tension of the abdomen took place in many, accompanied in some instances by a dull, and in others by an acute pain in the lower part of the belly.

IV. I come now to describe the state of the *secretions* and *excretions* as they appeared in different stages of this fever.

In some cases there was a constipation of the liver, if I may be allowed that expression, or a total obstruction of secretion and excretion of bile, but more frequently a preternatural secretion and excretion of it took place. It was discharged, in most cases, from the stomach and bowels in large quantities, and of very different qualities and colours.

1. On the first and second days of the disease many patients puked from half a pint to nearly a quart of green or yellow bile. Four cases came under my notice in which black bile was discharged on the *first* day. Three of these patients recovered.

2. There was frequently, on the 4th or 5th day, a discharge of matter from the stomach, resembling coffee impregnated with its grounds. This was always an alarming symptom. I believed it at first to be a modification of vi-

tiated bile, but subsequent dissections by Dr. Physick have taught me that it was the result of the first stage of those morbid actions in the stomach, which afterwards produce the black vomit. Many recovered who discharged this coffee-coloured matter.

3. Towards the close of this disease, there was a discharge of matter of a deep or pale black colour, from the stomach. Flaky substances frequently floated in the basin or chamber-pot upon the surface of this matter. It was what is called the *black-vomit*. It was formerly supposed to be vitiated bile, but it has been proved by Dr. Stewart, and afterwards by Dr. Physick, to be the effect of disease in the stomach.

4. There was frequently discharged from the stomach in the close of the disease, a large quantity of grumous blood, which exhibited a dark colour on its outside, resembling that of some of the matters which have been described, and which I believe was frequently mistaken for what is commonly known by the name of the *black vomit*. Several of my patients did me the honour to say, I had cured them after that symptom of approaching dissolution had made its appearance; but I am inclined to believe, dark-coloured blood, only, or the coffee-coloured matter, was mistaken for the matters which constitute the fatal black vomiting. I except here the black discharge before mentioned, which took place in three cases on the first day of the disease. This I have no doubt was bile, but it had not acquired its greatest acrimony, and it was discharged before mortification, or even inflammation could have taken place in the stomach. Several persons died without a black vomiting of any kind.

Along with all the discharges from the stomach which have been described, there was occasionally a large worm, and frequently large quantities of mucous and tough phlegm.

The colour, quality, and quantity of the *feces* depended very much upon the treatment of the disease. Where active purges had been given, the stools were copious, fœtid, and of a black or dark colour. When they were spontaneous, or excited by weak purges, they had a more natural appearance. In both cases they were sometimes of a green, and sometimes of an olive colour. Their smell was more or less fœtid, according to the time in which they had been detained in the bowels. I visited a lady who had pass-

ed several days without a stool, and who had been treated with tonic remedies. I gave her a purge, which in a few hours procured a discharge of fæces, so extremely fœtid, that they produced fainting in an old woman who attended her. The acrimony of the fæces was such as to excoriate the rectum, and sometimes to produce an extensive inflammation all around its external termination. The quantity of stools produced by a single purge was in many cases very great. They could be accounted for only by calling in the constant and rapid formation of them, by preternatural effusions of bile into the bowels.

I attended one person, and heard of two others, in whom the stools were as white as in the jaundice. I suspected, in these cases, the liver to be so constipated or paralyzed by the disease, as to be unable to secrete or excrete bile to colour the fæces. Large round worms were frequently discharged with the stools.

The *urine* was in some cases plentiful, and of a high colour. It was at times clear, and at other times turbid. About the 4th or 5th day, it sometimes assumed a dark colour, and resembled strong coffee. This colour, continued, in one instance, for several days after the patient recovered. In some, the discharge was accompanied by a burning pain, resembling that which takes place in a gonorrhœa. I met with one case in which this burning came on only in the evening, with the exacerbation of the fever, and went off with its remission in the morning.

A total deficiency of the urine took place in many people for a day or two, without pain. Dr. Sydenham takes notice of the same symptom in the highly inflammatory small-pox.* It generally accompanied or portended great danger. I heard of one case in which there was a *suppression* of urine, which could not be relieved without the use of the catheter.

A young man was attended by Mr. Fisher, one of my pupils, who discharged several quarts of limpid urine just before he died.

Dr. Arthaud informs us, in the history of a dissection of a person who died of the yellow fever, that the urine after death imparted a green colour to the tincture of radishes.†

* Wallace's edition, vol. i. p. 197.

† Rosier's Journal for January, 1790. vol. xxxvi. p. 380.

Many people were relieved by copious *sweats* on the first day of the disease. They were in some instances spontaneous, and in others they were excited by diluting drinks, or by strong purges. These sweats were often of a yellow colour, and sometimes had an offensive smell. They were in some cases cold, and attended at the same time with a full pulse. In general, the skin was dry in the beginning, as well as in the subsequent stages of the disease. I saw but few instances of its terminating like common fevers, by sweat, after the third day. I wish this fact to be remembered by the reader, for it laid part of the foundation of my method of treating this fever.

There was in some cases a preternatural secretion and excretion of *mucus* from the glands of the throat. It was discharged by an almost constant hawking and spitting. All who had this symptom recovered.

The *tongue* was in every case moist, and of a white colour, on the first and second days of the fever. As the disease advanced, it assumed a red colour, and a smooth shining appearance. It was not quite dry in this state. Towards the close of the fever, a dry black streak appeared in its middle, which gradually extended to every part of it. Few recovered after this appearance on the tongue took place.

V. In the *nervous system* the symptoms of the fever were different, according as it affected the brain, the muscles, the nerves, or the mind. The sudden and violent action of the miasmata induced apoplexy in several people. In some, it brought on syncope, and in others, convulsions in every part of the body. The apoplectic cases generally proved fatal, for they fell chiefly upon hard drinkers. Persons affected by syncope, or convulsions, sometimes fell down in the streets. Two cases of this kind happened near my house. One of them came under my notice. He was supposed by the by-standers to be drunk, but his countenance and convulsive motions soon convinced me that this was not the case.

A coma was observed in some people, or an obstinate wakefulness in every stage of the disease. The latter symptom most frequently attended the convalescence. Many were affected with immobility, or numbness in their limbs.

These symptoms were constant, or temporary, according to the nature of the remedies which were made use of to remove them. They extended to all the limbs, in some cases, and only to a part of them in others. In some, a violent cramp, both in the arms and legs, attended the first attack of the fever. I met with one case in which there was a difficulty of swallowing, from a spasmodic affection of the throat, such as occurs in the locked jaw.

A hiccup attended the last stage of this disease, but I think less frequently than the last stage of the common bilious fever. I saw but five cases of recovery where this symptom took place.

There was, in some instances, a deficiency of sensibility, but in others, a degree of it extending to every part of the body, which rendered the application of common rum to the skin, and even the least motion of the limbs, painful.

I was surprised to observe the last stage of this fever to exhibit so few of the symptoms of the common typhus or chronic fever. Tremors of the limbs and twitchings of the tendons were uncommon. They occurred only in those cases in which there was a predisposition to nervous diseases, and chiefly in the convalescent state of the disease.

While the muscles and nerves in many cases exhibited so many marks of preternatural weakness, in some they appeared to be affected with preternatural excitement. Hence patients in the close of the disease often rose from their beds, walked across their rooms, or came down stairs, with as much ease as if they had been in perfect health. I lost a patient in whom this state of morbid strength occurred to such a degree, that he stood up before his glass and shaved himself, on the day upon which he died.

The mind suffered with the morbid states of the brain and nerves. A delirium was a common symptom. It alternated in some cases with the exacerbations and remissions of the fever. In some it continued without a remission, until a few hours before death. Many, however, passed through the whole course of the disease without the least derangement in their ideas, even where there were evident signs of morbid congestion in the brain. Some were seized with maniacal symptoms. In these there was an *apparent* absence of fever. Such was the degree of this mania in one man, that he stripped off his shirt, left his bed,

and ran through the streets, with no other covering than a napkin on his head, at 8 o'clock at night, to the great terror of all who met him. The symptoms of mania occurred most frequently towards the close of the disease, and sometimes continued for many days and weeks, after all other febrile symptoms had disappeared.

The temper was much affected in this fever. There were few in whom it did not produce great depression of spirits. This was the case in many, in whom pious habits had subdued the fear of death. In some the temper became very irritable. Two cases of this kind came under my notice, in persons who, in good health, were distinguished for uncommon sweetness of disposition and manners.

I observed in several persons the operations of the understanding to be unimpaired throughout the whole course of the fever, who retained no remembrance of any thing that passed in their sickness. My pupil, Mr. Fisher, furnished a remarkable example of this correctness of understanding, with a suspension of memory. He neither said nor did any thing, during his illness, that indicated the least derangement of mind, and yet he recollected nothing that passed in his room, except my visits to him. His memory awakened upon my taking him by the hand, on the morning of the 6th day of his disease, and congratulating him upon his escape from the grave.

In some, there was a weakness, or total defect of memory, for several weeks after their recovery. Dr. Woodhouse informed me that he had met with a woman, who, after she had recovered, could not recollect her own name.

Perhaps it would be proper to rank that self-deception with respect to the nature and danger of the disease, which was so universal, among the instances of derangement of mind.

The pain which attended the disease was different, according to the different states of the system. In those cases in which it sunk under the violence of the disease, there was little or no pain. In proportion as the system was relieved from this oppression it recovered its sensibility. The pain in the head was acute and distressing. It affected the eye-balls in a peculiar manner. A pain extended, in some cases, from the back of the head down the neck,

The ears were affected, in several persons, with a painful sensation, which they compared to a string drawing their two ears together through the brain. The sides, and the regions of the stomach, liver and bowels, were all, in different people, the seats of either dull or acute pains. The stomach, towards the close of the disease, was affected with a burning or spasmodic pain of the most distressing nature. It produced in some cases, great anguish of body and mind. In others it produced cries and shrieks, which were often heard on the opposite side of the streets to where the patients lay. The back suffered very much in this disease. The stoutest men complained, and even groaned under it. An acute pain extended, in some cases, from the back to one, or both thighs. The arms and legs sympathized with every other part of the body. One of my patients, upon whose limbs the disease fell with its principal force, said that his legs felt as if they had been scraped with a sharp instrument. The sympathy of friends with the distresses of the sick extended to a small part of their misery, when it did not include their sufferings from pain. One of the dearest friends I ever lost by death declared, in the height of her illness, that "no one knew the pains of a yellow fever, but those who felt them."

VI. The *senses* and *appetites* exhibited several marks of the universal ravages of this fever upon the body. A deafness attended in many cases, but it was not often, as in the nervous fever, a favourable symptom. A dimness of sight was very common in the beginning of the disease. Many were affected with temporary blindness. In some there was a loss of sight in consequence of gutta serena, or a total destruction of the substance of the eye. There was in many persons a soreness to the touch which extended all over the body. I have often observed this symptom to be the forerunner of a favourable issue of a nervous fever, but it was less frequently the case in this disease.

The *thirst* was moderate or absent in some cases, but it occurred in the greatest number of persons whom I saw in this fever. Sometimes it was very intense. One of my patients, who suffered by an excessive draught of cold water, declared, just before he died, that "he could drink up the Delaware." It was always an alarming symptom when this thirst came on in this extravagant degree in the

last stage of the disease. In the beginning of the fever it generally abated upon the appearance of a moist skin. Water was preferred to all other drinks.

The *appetite* for food was impaired in this, as in all other fevers, but it returned much sooner than is common after the patient began to recover. Coffee was relished in the remissions of the fever, in every stage of the disease. So keen was the appetite for solid, and more especially for animal food, after the solution of the fever, that many suffered from eating aliment that was improper from its quality or quantity. There was a general disrelish for wine, but malt liquors were frequently grateful to the taste.

Many people retained a relish for tobacco much longer after they were attacked by this fever, and acquired a relish for it much sooner after they began to recover, than are common in any other febrile disease. I met with one case in which a man, who was so ill as to require two bleedings, continued to chew tobacco through every stage of his fever.

The convalescence from this disease was marked, in some instances, by a sudden revival of the venereal appetite. Several weddings took place in the city between persons who had recovered from the fever. Twelve took place among the convalescents in the hospital at Bush-hill. I wish I could add that the passion of the sexes for each other, among those subjects of public charity, was always gratified only in a lawful way. Delicacy forbids a detail of the scenes of debauchery which were practised near the hospital, in some of the tents which had been appropriated for the reception of convalescents. It was not peculiar to this fever to produce this morbid excitability of the venereal appetite. It was produced in a much higher degree by the plague which raged in Messina in the year 1743.

VII. The *lymphatic* and *glandular system* did not escape without some signs of this disease. I met with three cases of swellings in the inguinal, two in the parotid, and one in the cervical glands: all these patients recovered without a suppuration of their swellings. They were extremely painful in one case in which no redness or inflammation appeared. In the others there was considerable inflammation and but little pain.

In one of the cases of inguinal buboes, the whole force of the disease seemed to be collected into the lymphatic

system. The patient walked about, and had no fever nor pain in any part of his body, except in his groin. In another case which came under my care, a swelling and pain extended from the groin along the spermatic cord into one of the testicles. These glandular swellings were not peculiar to this epidemic. They occurred in the yellow fever of Jamaica, as described by Dr. Williams, and always with a happy issue of the disease.* A similar concentration of the whole force of the plague in the lymphatic glands is taken notice of by Dr. Patrick Russel.

VIII. The *skin* exhibited many marks of this fever. It was preternaturally warm in some cases, but it was often preternaturally cool. In some there was a distressing coldness in the limbs for two or three days. The yellow colour from which this fever has derived its name, was not universal. It seldom appeared where purges had been given in sufficient doses. The yellowness rarely appeared before the third, and generally about the fifth or seventh day of the fever. Its early appearance always denoted great danger. It sometimes appeared first on the neck and breast, instead of the eyes. In one of my patients it discovered itself first behind one of his ears, and on the crown of his head, which had been bald for several years. The remissions and exacerbations of the fever seemed to have an influence upon this colour, for it appeared and disappeared altogether, or with fainter or deeper shades of yellow, two or three times in the course of the disease. The eyes seldom escaped a yellow tinge; and yet I saw a number of cases in which the disease appeared with uncommon malignity and danger, without the presence of this symptom.

There was a clay-coloured appearance in the face, in some cases, which was very different from the yellow colour which has been described. It occurred in the last stage of the fever, and in no instance did I see a recovery after it.

There were eruptions of various kinds on the skin, each of which I shall briefly describe.

1. I met with two cases of an eruption on the skin, resembling that which occurs in the scarlet fever. Dr. Hume says, pimples often appear on the pit of the stomach, in the yellow fever of Jamaica. I examined the external region

* Essay on the Bilious or Yellow Fever, p. 35.

of the stomach in many of my patients, without discovering them.

2. I met with one case in which there was an eruption of watery blisters, which, after bursting, ended in deep, black sores.

3. There was an eruption about the mouth in many people, which ended in scabs, similar to those which take place in the common bilious fever. They always afforded a prospect of a favourable issue of the disease.

4. Many persons had eruptions which resembled mosquito bites. They were red and circumscribed. They appeared chiefly on the arms, but they sometimes extended to the breast. Like the yellow colour of the skin, they appeared and disappeared two or three times in the course of the disease.

5. Pecthiæ were common in the latter stage of the fever. They sometimes came on in large, and at other times in small red blotches; but they soon acquired a dark colour. In most cases they were the harbingers of death.

6. Several cases of carbuncles, such as occur in the plague, came under my notice. They were large and hard swellings on the limbs, with a black apex, which, upon being opened, discharged a thin, dark-coloured, bloody matter. From one of these malignant sores an hæmorrhage took place, which precipitated the death of the amiable widow of Dr. John Morris.

7. A large and painful anthrax on the back succeeded a favourable issue of the fever in the Rev. Dr. Blackwell.

8. I met with a woman who showed me the marks of a number of small biles on her face and neck, which accompanied her fever.

Notwithstanding this disposition to cutaneous eruptions in this disease, it was remarkable that blisters were much less disposed to mortify than in the common nervous fever. I met with only one case in which a deep-seated ulcer followed the application of blisters to the legs. Such was the insensibility of the skin in some people, that blisters made no impression upon it.

IX. The *blood* in this fever has been supposed to undergo a change from a healthy to a putrid state, and many of its symptoms which have been described, particularly the hæmorrhages and eruptions on the skin, have been ascribed

to this supposed putrefaction of the blood. It would be easy to multiply arguments, in addition to those mentioned in another place,* to prove that no such thing as putrefaction can take place in the blood, and that the symptoms which have been supposed to prove its existence are all effects of a sudden, violent, and rapid inflammatory action or pressure upon the blood-vessels, and hence the external and internal hæmorrhages. The petechiæ on the surface of the skin depend upon the same cause. They are nothing but effusions of serum or red blood, from a rupture or preternatural dilatation of the capillary vessels.† The smell emitted from persons affected by this disease was far from being of a putrid nature; and if this had been the case, it would not have proved the existence of putrefaction in the blood, for a putrid smell is often discharged from the lungs, and from the pores in sweat, which is wholly unconnected with a putrid, or perhaps any other morbid state of the blood. There are plants which discharge an odour which conveys to the nose a sensation like that of putrefaction; and yet these plants exist, at the same time, in a state of the most healthy vegetation: nor does the early putrid smell of a body which perishes with this fever prove a putrid change to have taken place in the blood before death. All animals which die suddenly, and without loss of blood, are disposed to a speedy putrefaction. This has long been remarked in animals that have been killed after a chase, or by lightning. The poisonous air called *samiel*, which is described by Chardin, produces, when it destroys life, instant putrefaction. The bodies of men who die of violent passions, or after strong convulsions, or even after great muscular exertion, putrify in a few hours after death. The healthy state of the body depends upon a certain state of arrangement in the fluids. A derangement of these fluids is the natural consequence of the violent and rapid motions, or of the undue pressure upon the solids, which have been mentioned. It occurs in cases of death which are induced by the excessive force of stimulus, whe-

* Outlines of the phenomena of fever.

† See Wallis's edition of Sydenham, vol. i. p. 165. vol. ii. p. 52, 94, 98, 350; De Haen's *Ratio Medendi*, vol. ii. p. 162. vol. iv. p. 172; Gaubii *Pathologia*, sect. 498; and Dr. Seybert's inaugural dissertation, entitled "An Attempt to disprove the Doctrine of Putrefaction of the Blood in Living Animals," published in Philadelphia, in 1793.

ther it be from miasmata, or the volatile vitriolic acid which is supposed to constitute the destructive samiel wind, or from violent commotions excited in the body by external or internal causes. The practice among fishermen, in some countries, of breaking the heads of their fish as soon as they are taken out of the water, in order to retard their putrefaction, proves the truth of the explanation I have given of its cause, soon after death. The sudden extinction of life in the fish prevents those convulsive or violent motions, which induce sudden *disorganization* in their bodies. It was observed that putrefaction took place most speedily after death from the yellow fever, where the commotions of the system were not relieved by evacuations. In those cases where purges and bleeding had been used, putrefaction did not take place sooner after death than is common in any other febrile disease, under equal circumstances of heat and air.

Thus I have described the symptoms of this fever. From the history I have given, it appears that it counterfeited nearly all the acute and chronic forms of disease to which the human body is subject. An epitome, both of its symptoms and its theory, is happily delivered by Dr. Sydenham, in the following words. After describing the epidemic cough, pleurisy, and peripneumony of 1675, he adds, "But in other epidemics, the symptoms are so slight from the disturbance raised in the blood by the morbid particles contained in the mass, that nature being in a manner *oppressed*, is rendered unable to produce *regular* symptoms that are suitable to the disease; and almost all the phenomena that happen are *irregular*, by reason of the entire *subversion* of the animal economy; in which case the fever is often *depressed*, which, of its own nature, would be very high. Sometimes also fewer signs of a fever appear than the nature of the disease requires, from a translation of the malignant cause, either to the nervous system, or to some other parts of the body, or to some of the juices not contained in the blood; whilst the morbid matter is yet turgid."*

The disease ended in death in various ways. In some it was sudden; in others it came on by gradual approaches. In some the last hours of life were marked with great pain, and strong convulsions; but in many more, death

* Wallis's edition, vol. i. p. 344.

seemed to insinuate itself into the system, with all the gentleness of natural sleep. Mr. Powell expired with a smile on his countenance. Dr. Griffiths informed me that Dr. Johnson exhibited the same symptom in the last hours of his life. This placid appearance of the countenance, in the act of dying, was not new to me. It frequently occurs in diseases which affect the brain and nerves. I lost a patient, in the year 1791, with the gout, who not only smiled, but laughed, a few minutes before he expired.

I proceed now to mention some peculiarities of the fever, which could not be brought in under any of the foregoing heads.

In every case of this disease which came under my notice, there were evident remissions, or intermissions of the fever, or of such symptoms as were substituted for fever. I have long considered, with Mr. Senac, a *tertian* as the only original type of all fevers. The bilious yellow fever indicated its descent from this parent disease. I met with many cases of regular tertians, in which the patients were so well on the intermediate days as to go abroad. It appeared in this form in Mr. Van Berkel, the minister of the United Netherlands. Nor was this mild form of the fever devoid of danger. Many died who neglected it, or who took the common remedies for intermittents to cure it. It generally ended in a remittent before it destroyed the patient. The tertian type discovered itself in some people after the more violent symptoms of the fever had been subdued, and continued in them for several weeks. It changed from a tertian to a quartan type in Mr. Thomas Willing, nearly a month after his recovery from the more acute and inflammatory symptoms of the disease.

It is nothing new for a malignant fever to appear in the form of a tertian. It is frequently the garb of the plague. Riverius describes a tertian fever which proved fatal on the third day, which was evidently derived from the same exhalation which produced a continual malignant fever.*

The remissions were more evident in this, than in the common bilious fever. They generally occurred in the forenoon. It was my misfortune to be deprived, by the great number of my patients, of that command of time which was necessary to watch the exacerbations of this

* De Febre Pestilenti, vol. xi. p. 93.

fever under all their various changes, as to time, force, and duration. From all the observations that were suggested by visits, at hours that were seldom left to my choice, I was led to conclude, that the fever exhibited, in different people, all that variety of forms which has been described by Dr. Cleghorn, in his account of the tertian fever of Minorca. A violent exacerbation on even days was evidently attended with more danger than on odd days. The same thing was observed by Dr. Mitchell, in the yellow fever of Virginia, in the year 1741. "If (says he) the exacerbations were on equal days, they generally died in the third paroxysm, or the sixth day; but if on unequal days, they recovered on the seventh."

The deaths which occurred on the 3d, 5th, and 7th days, appeared frequently to be the effects of the commotions, or depression, produced in the system on the 2d, 4th, and 6th days.

An apparent remission on the 3d day was frequently such as to beget a belief that the disease had run its course, and that all danger was over. A violent attack of the fever on the 4th day removed this deception; and, if a relaxation had taken place in the use of proper remedies on the 3d day, death frequently occurred on the 5th or the 7th.

The termination of this fever in life and death was much more frequent on the 3d, 5th, 7th, 9th, and 11th days, than is common in the mild remitting fever. Where death occurred on the even days, it seemed to be the effect of a violent paroxysm of the fever, or of great vigour of constitution, or of the force of medicine which protracted some of the motions of life beyond the close of the odd days which have been mentioned.

I think I observed the fever to terminate on the third day more frequently in August, and during the first ten days in September, than it did after the weather became cool. In this it resembled the common bilious remittents of our city, also the simple tertians described by Dr. Cleghorn.* The danger seemed to be in proportion to the tendency of the disease to a speedy crisis; hence more died in August, in proportion to the number who were affected, than in September or October, when the disease was left to itself. But, however strange after this remark it may appear, the

* Diseases of Minorca, p. 185.

disease yielded to the remedies which finally subdued it more speedily and certainly upon its first appearance in the city, than it did two or three weeks afterwards.

The disease continued for fifteen, twenty, and even thirty days, in some people. Its duration was much influenced by the weather, and by the use or neglect of certain remedies (to be mentioned hereafter) in the first stage of the disease.

It has been common with authors to divide the symptoms of this fever into three different stages. The order I have pursued in the history of those symptoms will render this division unnecessary. It will, I hope, be more useful to divide the patients affected with the disease into three classes.

The *first* includes those in whom the stimulus of the miasmata produced coma, languor, sighing, a disposition to syncope, and a weak or slow pulse.

The *second* includes those in whom the miasmata acted with less force, producing great pain in the head, and other parts of the body; delirium, vomiting, heat, thirst, and a quick, tense, or full pulse, with obvious remissions or intermissions of the fever.

The *third* class includes all those persons in whom the miasmata acted so feebly as not to confine them to their beds or houses. This class of persons affected by the yellow fever was very numerous. Many of them recovered without medical aid, or by the use of domestic prescriptions; many of them recovered in consequence of a spontaneous diarrhoea, or plentiful sweats; many were saved by moderate bleeding and purging; while some died, who conceived their complaints to be occasioned by a common cold, and neglected to take proper care of themselves, or to use the necessary means for their recovery. It is not peculiar to the yellow fever to produce this feeble operation upon the system. It has been observed in the southern states of America, that in those seasons in which the common bilious fever is epidemic, "no body is quite well," and that what are called in those states "inward fevers," are universal. The small-pox, even in the natural way, does not always confine the patient; and thousands pass through the plague without being confined to their beds or houses. Dr. Hodges prescribed for this class of patients in his parlour in London, in the year 1665, and Dr. Patrick Russel did

the same from a chamber window fifteen feet above the level of the street at Aleppo. Notwithstanding the mild form the plague put on in these cases, it often proved fatal according to Dr. Russel. I have introduced these facts chiefly with a view of preparing the reader to reject the opinion that we had two species of fever in the city at the same time; and to show that the yellow fever appears in a more simple form than with "strongly marked" characters; or, in other words, with a yellow skin and a black vomiting.

It is remarkable that this fever always found out the weak part of every constitution it attacked. The head, the lungs, the stomach, the bowels, and the limbs, suffered more or less, according as they were more or less debilitated by previous inflammatory or nervous diseases, or by a mixture of both, as in the gout.

I have before remarked, that the influenza, the scarlatina, and a mild bilious remittent, prevailed in the city, before the yellow fever made its appearance. In the course of a few weeks they all disappeared, or appeared with symptoms of the yellow fever; so that, after the first week of September, it was the solitary epidemic of the city.

The only case like influenza which I saw after the 5th of September, was in a girl of 14 years of age, on the 13th of the month. It came on with a sneezing and cough. I was called to her on the third day of her disease. The instant I felt her pulse, I pronounced her disease to be the yellow fever. Her father was offended with this opinion, although he lived in a highly infected neighbourhood, and objected to the remedies I prescribed for her. In a few days she died. In the course of ten days, her father and sister were infected, and both died, I was informed, with the usual symptoms of the yellow fever.

It has been an axiom in medicine, time immemorial, that no two fevers of unequal force can exist long together in the same place. As this axiom seems to have been forgotten by many of the physicians of Philadelphia, and as the ignorance or neglect of it led to that contrariety of opinion and practice, which unhappily took place in the treatment of the disease, I hope I shall be excused by those physicians, to whom this fact is as familiar as the most simple law of nature, if I fill a few pages with proofs of it, from practical writers.

Thucydides long ago remarked, that the plague chased all other diseases from Athens, or obliged them to change their nature, by assuming some of its symptoms.

Dr. Sydenham makes the same remark upon the plague in London, in 1665. Dr. Hodges, in his account of the same plague, says, that “at the rise of the plague all other distempers went into it, but that, as its declension, it degenerated into others, as inflammations, head-ach, quinsies, dysenteries, small-pox, measles, fevers, and hectic, wherein the plague yet predominated.”*

During the prevalence of the plague in Grand Cairo, no sporadic disease of any kind makes its appearance. The same observation is made by Sauvage, in his account of the plague at Alais, in the province of Languedoc.†

The small-pox, though a disease of less force than the plague, has often chased it from Constantinople, probably from its being in a declining state. But this exclusive prevalence of a single epidemic is not confined to the plague and small-pox; Dr. Sydenham’s writings are full of proofs of the dominion of febrile diseases over each other. Hence, after treating upon a symptomatic pleurisy which sometimes accompanied a slow fever, in the year 1675, and which had probably been injudiciously treated by some of those physicians who prescribe for the name of a disease, he delivers the following aphorism: “Whoever, in the cure of fevers, hath not always in view the constitution of the year, inasmuch as it tends to produce some particular epidemic disease, and likewise to reduce all the cotemporary diseases to its own form and likeness, proceeds in an uncertain and fallacious way.”‡ It appears further, from the writings of this excellent physician, that where the monarchy of a single disease was not immediately acknowledged, by a sudden retreat of all cotemporary diseases, they were forced to do homage to it, by wearing its livery. It would be easy to multiply proofs of this assertion, from the numerous histories of epidemics which are to be found in his works. I shall mention only one or two of them. A continual fever, accompanied by a dry skin, had prevailed for

* Dr. Hodges’ Account of the Plague in London, p. 26.

† Sed hoc observatu dignum fuit, omnes alios morbos acutos durante peste siluisse, et omnes morbos acutos e pestis genere suisse. *Nosologia Methodica*, vol. i. p. 416.

‡ Vol. i. p. 340.

some time in the city of London. During the continuance of this fever, the regular small-pox made its appearance. It is peculiar to the small-pox, when of a distinct nature, to be attended by irregular sweats before the eruption of the pock. The continual fever now put on a new symptom. It was attended by sweats in its first stage, exactly like those which attended the eruptive fever of the small-pox.* This despotism of a powerful epidemic extended itself to the most trifling indispositions. It even blended itself, Dr. Sydenham tells us, with the commotions excited in the system by the suppression of the lochia, as well as with the common puerperile fever.† Dr. Morton has left testimonies behind him, in different parts of his works, which establish, in the most ample manner, the truth of Dr. Sydenham's observations. Dr. Huxham describes the small-pox as blending some of its symptoms with those of a slow fever, at Plymouth, in the year 1729.‡ Dr. Cleghorn mentions a constitution of the air at Minorca, so highly inflammatory, "that not only tertian fevers, but even a common hurt or bruise required more plentiful evacuations than ordinary."§ Riverius informs us, in his history of a pestilential fever that prevailed in France, that "united itself with phrenitis, angina, pleurisy, peripneumony, hepatitis, dysentery, and many other diseases."||

The bilious remitting fever which prevailed in Philadelphia, in 1780, chased away every other febrile disease; and the scarlatina anginosa which prevailed in our city, in 1783 and 1784, furnished a striking proof of the influence of epidemics over each other. In the account which I published of this disease, in the year 1789, there are the following remarks. "The intermitting fever which made its appearance in August was not lost during the month of September. It continued to prevail, but with several peculiar symptoms. In many persons it was accompanied by an eruption on the skin, and a swelling of the hands and feet. In some it was attended with sore throat, and pains behind the ears. Indeed such was the prevalence of the contagion which produced the scarlatina anginosa, that

* Vol. i. p. 352.

† Vol. ii. p. 164. See also p. 1, 109, 122, 204, 212, 233, 274, 355, 358-9, and 436.

‡ De Acre et Morb. Epidem. p. 33, 34.

§ Page 285.

|| De Febre Pestilenti, vol. ii. p. 95.

many hundred people complained of sore throats, without any other symptom of indisposition. The slightest exciting cause, and particularly cold, seldom failed of producing the disease.”*

I shall mention only one more authority in favour of the influence of a single epidemic upon diseases. It is taken from Mr. Clark’s *Essay on the Epidemic Disease of Lying-in Women of the years 1787 and 1788*. “There does not appear to be any thing in a parturient state which can prevent women from being affected by the general causes of disease at that time; and should they become ill, their complaints will probably partake of the nature of the reigning epidemic.”† I have said that the fever sometimes put on the symptoms of dysentery, pleurisy, rheumatism, colic, palsy, and even of the locked jaw. That these were not original diseases, but symptomatic affections only of the reigning epidemic, will appear from other histories of bilious fevers. Dr. Balfour tells us, in his account of the intestinal remitting fever of Bengal,‡ that it often appeared with symptoms of dysentery, rheumatism, and pleurisy. Dr. Cleghorn and Dr. Lind mention many cases of the bilious fever appearing in the form of a dysentery. Dr. Clark ascribes the dysentery, the diarrhœa, the colic, and even the palsy, to the same cause which produced the bilious fever in the East-Indies;§ and Dr. Hunter, in his *Treatise upon the Diseases of Jamaica*, mentions the locked jaw as one of its occasional symptoms. Even the different grades of this fever, from the mildest intermittent to the most acute continual fever, have been distinctly traced by Lancissi to the same marsh exhalation.||

However irrefragably these numerous facts and authorities established the assertion of the prevalence of but one powerful epidemic at a time, the proposition will receive fresh support, from attending to the effects of two impressions of unequal force made upon the system at the same time: only one of them is felt; hence the gout is said to cure all other diseases. By its superior pain it destroys sensations of a less painful nature. The small-pox and measles have sometimes existed together in the body; but

* Vol. 1.

† Page 28.

‡ Page 132.

§ Observations on the Diseases in Long Voyages to the East-Indies, vol. i. p. 13. 14, 48, 151. vol. ii. p. 99, 318, and 320.

|| Lib. ii. cap. v.

this has, I believe, seldom occurred, where one of them has not been the predominating disease.* In this respect, this combination of epidemics only conforms to the general law which has been mentioned.

I beg pardon for the length of this digression. I did not introduce it to expose the mistakes of those physicians, who found as many diseases in our city as the yellow fever had symptoms, but to vindicate myself from the charge of innovation, in having uniformly and unequivocally asserted, after the first week in September, that the yellow fever was the only febrile disease which prevailed in the city.

Science has much to deplore from the multiplication of disease. It is as repugnant to truth in medicine, as polytheism is to truth in religion. The physician who considers every different affection of the different systems in the body, or every affection of different parts of the same system, as distinct diseases, when they arise from one cause, resembles the Indian or African savage, who considers water, dew, ice, frost, and snow, as distinct essences; while the physician who considers the morbid affections of every part of the body (however diversified they may be in their form or degrees) as derived from one cause, resembles the philosopher who considers dew, ice, frost, and snow, as different modifications of water, and as derived simply from the absence of heat.

Humanity has likewise much to deplore from this paganism in medicine. The sword will probably be sheathed for ever, as an instrument of death, before physicians will cease to add to the mortality of mankind, by prescribing for the names of diseases.

The facts I have delivered upon this subject will admit of a very important application to the cure, not only of the yellow fever, but of all other acute and dangerous epidemics. I shall hereafter assign a final cause for the law of epidemics which has been mentioned, which will discover a union of the goodness of the Supreme Being with one of the greatest calamities of human life.

All ages were affected by this fever, but persons between fourteen and forty years of age were most subject to it. Many old people had it, but it was not so fatal to them as to robust persons in middle life. It affected children of all

* Hunter on the Venereal Disease, Introduction, p 3.

ages. I met with a violent case of the disease in a child of four months, and a moderate case of it, in a child of but ten weeks old. The latter had a deep yellow skin. Both these children recovered.

The proportion of children who suffered by this fever may be conceived from a single fact. Seventy-five persons were buried in the grave-yard of the Swedish church in the months of August, September and October, twenty-four of whom were children. They were buried chiefly in September and October; months in which children generally enjoy good health in our city.

Men were more subject to the disease than women. Pregnancy seemed to expose women to it.

The refugees from the French West-Indies universally escaped it. This was not the case with the natives of France, who had been settled in the city.

It is nothing new for epidemics to affect persons of one nation, and to pass by persons of other nations, in the same city or country. At Nimeguen, in the year 1736, Deigner informs us, that the French people (two old men excepted), and the Jews, escaped a dysentery which was universal among persons of all other nations. Ramazini tells us, that the Jews at Modena escaped a tertian fever which affected nearly all the other inhabitants of the town. Shenkius says, that the Dutch and Italians escaped a plague, which prevailed for two years in one of the towns of Switzerland; and Dr. Bell, in an inaugural dissertation, published at Edinburgh, in 1779, remarks, that the jail fever, which attacked the soldiers of the Duke of Buccleugh's regiment, spared the French prisoners who were guarded by them. It is difficult to account for these facts. However numerous their causes may be, a difference in diet, which is as much a distinguishing mark of nations as dress or manners, will probably be found to be one of them.

From the accounts of the yellow fever which had been published by many writers, I was led to believe that the negroes in our city would escape it. In consequence of this belief, I published the following extract in the American Daily Advertiser, from Dr. Lining's History of the Yellow Fever, as it had four times appeared in Charleston, in South Carolina.

"There is something very singular (says the doctor) in

the constitution of the negroes, which renders them not liable to this fever ; for though many of them were as much exposed as the nurses to the infection, yet I never knew of one instance of this fever among them, though they are equally subject with the white people to the bilious fever.”*

A day or two after this publication the following letter from the mayor of the city, to Mr. Claypoole, the printer of the Mail, appeared in his paper.

“SIR,

“It is with peculiar satisfaction that I communicate to the public, through your paper, that the AFRICAN SOCIETY, touched with the distresses which arise from the present dangerous disorder, have voluntarily undertaken to furnish nurses to attend the afflicted ; and that, by applying to ABSALOM JONES and WILLIAM GRAY, both members of that society, they may be supplied.

MATTH. CLARKSON,

September 6th, 1793.

Mayor.

It was not long after these worthy Africans undertook the execution of their humane offer of services to the sick before I was convinced I had been mistaken. They took the disease in common with the white people, and many of them died with it. I think I observed the greatest number of them to sicken after the mornings and evenings became cool. A large number of them were my patients. The disease was lighter in them than in white people. I met with no case of hæmorrhage in a black patient.

The tobacconists and persons who used tobacco did not escape the disease. I observed snuff-takers to be more devoted to their boxes than usual, during the prevalence of the fever.

I have remarked, formerly, that servant maids suffered much by the disease. They were the only patients I lost in several large families. I ascribe their deaths to the following causes :

1st. To the great and unusual debility induced upon their systems by labour in attending their masters and mis-

* Essays and Observations, Physical and Literary, vol. xi. page 409.

tresses, or their children. Debility, according to its degrees and duration, seems to have had the same effect upon the mortality of this fever that it has upon the mortality of an inflammation of the lungs. When it is moderate and of short duration, it predisposes only to a common pneumonia; but when it is violent and protracted, in its degrees and duration, it predisposes a pulmonary consumption.

2dly. To their receiving large quantities of impure air into their bodies, and in a most concentrated state, by being obliged to perform the most menial offices for the sick, and by washing, as well as removing foul linen, and the like.

3dly. To their being left more alone in confined or distant rooms, and thereby suffering from depression of spirits, or the want of a punctual supply of food and medicines.

There did not appear to be any advantage from smelling vinegar, tar, camphor, or volatile salts, in preventing the disease. Bark and wine were equally ineffectual for that purpose. I was called to many hundred people who were infected after using one or more of them. Nor did the white washing walls secure families from the disease. I am disposed to believe garlic was the only substance that was in any degree useful in preventing it. I met with several persons who chewed it constantly, and who were much exposed to the miasmata without being infected. All other substances seemed to do harm by begetting a false confidence in the mind, to the exclusion of more rational preservatives. I have suspected further, that such of them as were of a volatile nature helped to spread the disease by affording a vehicle for miasmata through the air.

There was great mortality in all those families who lived in wooden houses. Whether this arose from the small size of these houses, or from the want of cleanliness of the people who occupied them, or from the miasmata becoming more accumulated, by adhering to the wood, I am unable to determine. Perhaps it was the effect of the co-operation of all three of those causes.

I have said, formerly, that intemperance in drinking predisposed to the disease; but there were several instances of persons having escaped it who were constantly under the influence of strong drink. The stimulus of ardent spirits probably predominated over the stimulus of the miasmata,

and thus excited an artificial fever which defended the system from that which was epidemic.

I heard of some sea-faring people who lived on board their vessels who escaped the disease. The smell of the tar was supposed to have preserved them; but, from its being ineffectual in other cases, I am disposed to ascribe their escape to the infected air of the city being destroyed by a mixture with the water of the Delaware.

Many people who were infected in the city, were attacked by the disease in the country, but they did not propagate it, even to persons who slept in the same room with them.

Dr. Lind informs us, that many persons escaped the yellow fever which prevailed in Pensacola in the year 1765, by retiring to the ships which lay in the harbour, and that when the disease had been taken, the pure air of the water changed it into an intermitting fever.* The same changes have frequently been produced in malignant fevers, by sending patients infected with them from the foul air of a city, into the pure air of the country.

Persons confined in the house of employment, in the hospital, and in the jail, escaped the fever. The airy and remote situation of those buildings was probably the chief means of their preservation. Perhaps they derived additional security from their simple diet, their exemption from hard labour, and from being constantly sheltered from heat and cold.

Several families, who shut up their front and back doors and windows, and avoided going out of their houses except to procure provisions, escaped the disease.

I have taken some pains to ascertain, whether any class of tradesmen escaped the fever, or whether there was any species of labour which protected from it. The result of my inquiries is as follows: three butchers only, out of nearly one hundred who remained in the city, died with the disease. Many of them attended the markets every day. Two painters who worked at their business during the whole time of the prevalence of the fever, and in exposed situations, escaped it. Out of forty scavengers who were employed in collecting and carrying away the dirt of the streets, only one was affected by the fever and died. Very

* Diseases of Warm Climates, p. 169.

few grave-diggers, compared with the number who were employed in that business, were infected; and it is well known, that scarcely an instance was heard of persons taking the disease, who were constantly employed in digging cellars. The fact is not new that grave-diggers escape malignant fevers. It is taken notice of by Dr. Clark.

It was said by some physicians in the public papers, that the neighbourhood of the grave-yards was more infected than other parts of the city. The reverse of this assertion was true in several cases, owing probably to the miasmata being diluted and weakened by its mixture with the air of the grave-yards: for this air was pure, compared with that which stagnated in the streets.

It was said further, that the disease was propagated by the inhabitants assembling on Sundays for public worship; and, as a proof of this assertion, it was reported, that the deaths were more numerous on Sundays than on other days; occasioned by the infection received on one Sunday producing death on the succeeding first day of the week. The register of the deaths shows that this was not the case. I am disposed to believe that fewer people sickened on Sundays, than on any other day of the week; owing to the general rest from labour, which I have before said was one of the exciting causes of the disease. From some facts to be mentioned presently, it will appear probable, that places of public worship, in consequence of their size, as well as of their being shut up during the greatest part of the week, were the freest from miasmata of any houses in the city. It is agreeable to discover in this, as well as in all other cases of public and private duty, that the means of health and moral happiness are in no one instance opposed to each other.

The disease, which was first confined to Water-street, soon spread through the whole city. After the 15th of September, the atmosphere of every street in the city was charged with miasmata; and there were few citizens in apparent good health, who did not exhibit one or more of the following marks of their presence in their bodies.

1. A yellowness in the eyes, and a sallow colour upon their skin.

2. A preternatural quickness in the pulse. I found but two exceptions to this remark, out of a great number of

persons whose pulses I examined. In one of them, it discovered several preternatural intermissions in the course of a minute. This quickness of pulse occurred in the negroes, as well as in the white people. I met with it in a woman who had had the yellow fever in 1762. In two women, and in one man above 70, the pulse beat upwards of 90 strokes in a minute. This preternatural state of the pulse during the prevalence of a pestilential fever, in persons in health, is taken notice of by Riverius.*

3. Frequent and copious discharges by the skin of yellow sweats. In some persons, these sweats sometimes had an offensive smell, resembling that of the washings of a gun.

4. A scanty discharge of high-coloured or turbid urine.

5. A deficiency of appetite, or a greater degree of it than was natural.

6. Costiveness.

7. Wakefulness.

8. Head-ach.

9. A preternatural dilatation of the pupils. This was universal. I was much struck in observing the pupil in one of the eyes of a young man who called upon me for advice, to be of an oblong figure. Whether it was natural, or the effect of the miasmata acting on his brain, I could not determine.

It will be thought less strange that the miasmata should produce these changes in the systems of persons who resided constantly in the city, when I add, that many country people, who spent but a few hours in the streets in the day, in attending the markets, were infected by the disease, and sickened and died after they returned home; and that others, whom business compelled to spend a day or two in the city during the prevalence of the fever, but who escaped an attack of it, declared that they were indisposed, during the whole time, with languor or head-ach.

I was led to observe and record the above effects of the miasmata upon persons in apparent good health, by a fact I met with in Dr. Mitchell's History of the Yellow Fever in Virginia, in the Year 1741. In that fever, blood drawn from a vein was always dissolved. The same state of the

* "Pulsus sanorum pulsibus similes admodum, periculosi"—*De Febre Pestilenti*, p. 114.

blood was observed in many persons who had been exposed to the miasmata, who discovered no other symptom of the disease.

A woman whom I had formerly cured of a mania, who lived in an infected neighbourhood, had a fresh attack of that disease, accompanied by an unusual menstrual flux. I ascribed both these complaints to the action of the miasmata upon her system.

The smell emitted from a patient, in a clean room, was like that of the small-pox, but in most cases of a less disagreeable nature. Putrid smells in sick rooms were the effects of the excretions, or of some other filthy matters. In small rooms, crowded in some instances with four or five sick people, there was an effluvia that produced giddiness, sickness at stomach, a weakness of the limbs, faintness, and in some cases a diarrhœa. I met with a fœtid breath in one patient, which was not the effect of that medicine which sometimes produces it.

The state of the atmosphere, during the whole month of September, and the first two weeks in October, favoured the accumulation of the miasmata in the city.

The register of the weather shows how little the air was agitated by winds during the above time. In vain were changes in the moon expected to alter the state of the air. The light of the morning mocked the hopes that were raised by a cloudy sky in the evening. The sun ceased to be viewed with pleasure. Hundreds sickened every day beneath the influence of his rays: and even where they did not excite the disease, they produced a languor in the body unknown to the oldest inhabitant of the city, at the same season of the year.

A meteor was seen at two o'clock in the morning, on or about the twelfth of September. It fell between Third street and the hospital, nearly in a line with Pine street. Mosquitoes (the usual attendants of a sickly autumn) were uncommonly numerous. Here and there a dead cat added to the impurity of the air of the streets. It was supposed those animals perished with hunger in the city, in consequence of so many houses being deserted by the inhabitants, who had fled into the country; but the observations of subsequent years made it more probable they were destroyed by the same morbid state of the atmosphere which produced the reigning epidemic.

It appears further, from the register of the weather, that there was no rain between the 25th of August and the 15th of October, except a few drops, hardly enough to lay the dust of the streets, on the 9th of September, and the 12th of October. In consequence of this drought, the springs and wells failed in many parts of the country. The dust in some places extended two feet below the surface of the ground. The pastures were deficient, or burnt up. There was a scarcity of autumnal fruits in the neighbourhood of the city. But while vegetation drooped or died from the want of moisture in some places, it revived with preternatural vigour from unusual heat in others. Cherry-trees blossomed, and apple, pear, and plum-trees bore young fruit in several gardens in Trenton, thirty miles from Philadelphia, in the month of October.

However inoffensive uniform heat, when agitated by gentle breezes, may be, there is, I believe, no record of a dry, warm, and stagnating air having existed for any length of time without producing diseases. Hippocrates, in describing a pestilential fever, says the year in which it prevailed was without a breeze of wind.* The same state of the atmosphere, for six weeks, is mentioned in many of the histories of the plague which prevailed in London, in 1665.† Even the sea air itself becomes unwholesome by stagnating; hence Dr. Clark informs us, that sailors become sickly after long calms in East-India voyages.‡ Sir John Pringle delivers the following aphorism from a number of similar observations upon this subject: "When the heats come on soon, and continue throughout autumn, not moderated by winds or rains, the season proves sickly, distempers appear early, and are dangerous."§

Who can review this account of the universal diffusion of the miasmata which produced this disease, its universal effects upon persons apparently in good health, and its accumulation and concentration, in consequence of the calmness of the air, and believe that it was possible for a febrile disease to exist at that time in our city that was not derived from that source?

The West-India writers upon the yellow fever have said

* "Sine aura, usque annus fuit."—*Epid.* 3.

† Letter from Sir John Bernard to Dr. Floyer, p. 233.

‡ Vol. i. p. 5.

§ Diseases of the Army, p. 5, of the 7th London edition.

that it is seldom taken twice, except by persons who have spent some years in Europe or America in the interval between its first and second attack. I directed my inquiries to this question, and I now proceed to mention the result of them. I met with five persons, during the prevalence of the disease, who had had it formerly, two of them in the year 1741, and three in 1762, who escaped it in 1793, although they were all more or less exposed to the infection. One of them felt a constant pain in her head while the disease was in her family. Four of them were aged, and of course less liable to be acted upon by the miasmata than persons in early or middle life. Mr. Thomas Shields furnished an unequivocal proof that the disease could be taken after an interval of many years. He had it in the year 1762, and narrowly escaped from a violent attack of it this year. Cases of reinfection were very common during the prevalence of this fever. They occurred most frequently where the first attack had been light. But they succeeded attacks that were severe in Dr. Griffiths, Dr. Mease, my pupil Mr. Coxe, and several others, whose cases came under my notice.

I have before remarked that the miasmata sometimes excited a fever as soon as they were taken into the body, but that they often lay there from one to sixteen days before they produced the disease. How long they existed in the body after a recovery from the fever I could not tell, for persons who recovered were, in most cases, exposed to their action from external sources. The preternatural dilatation of the pupils was a certain mark of the continuance of some portion of them in the system. In one person who was attacked with the fever on the night of the 9th of October, the pupils did not contract to their natural dimensions until the 7th of November.

Having described the effects of the miasmata upon the body, I proceed now to mention the changes induced upon it by death.

Let us first take a view of it as it appeared soon after death. Some new light may perhaps be thrown upon the proximate cause of the disease by this mode of examining the body.

My information upon this subject was derived from the attendants upon the sick, and from two African citizens who were employed in burying the dead, viz. Richard

Allen and Absalom Jones. The coincidence of the information I received from different persons satisfied me that all that I shall here relate is both accurate and just.

A deep yellow colour appeared in many cases within a few minutes after death. In some the skin became purple, and in others black. I heard of one case in which the body was yellow above, and black below its middle. In some the skin was as pale as it is in persons who die of common fevers. A placid countenance was observed in many, resembling that which occurs in an easy and healthful sleep.

Some were stiff within one hour after death. Others were not so for six hours afterwards. This sudden stiffness after death, Dr. Valli informs us, occurred in persons who died of the plague in Smyrna, in the year 1784.*

Some grew cold soon after death, while others retained a considerable degree of heat for six hours, more especially on their backs.

A stream of tears appeared on the cheeks of a young woman, which seemed to have flowed after her death.

Some putrefied in a short time after their dissolution, but others had no smell for twelve, eighteen, and twenty hours afterwards. This absence of smell occurred in those cases in which evacuations had been used without success in the treatment of the disease.

Many discharged large quantities of black matter from the bowels, and others blood from the nose, mouth, and bowels, after death. The frequency of these discharges gave rise to the practice of pitching the joints of the coffins that were used to bury the dead.

The morbid appearances of the internal parts of the body, as exhibited by dissection after death from the yellow fever, are different in different countries, and in the same countries in different years. I consider them all as effects only of a stimulus acting upon the whole system, and determined more or less by accidental circumstances to particular viscera. Perhaps the stimulus of the miasmata determines the fluids more violently in most cases to the liver, stomach, and bowels, and thereby disposes them more than other parts to inflammation and mortification, and to similar effusions and eruptions with those which take place on the skin. There can be no doubt of the miasmata acting upon the

* Experiments on Animal Electricity, p. 90.

liver, and thereby altering the qualities of the bile. I transcribe, with great pleasure, the following account of the state of the bile in a female slave of forty years of age, from Dr. Mitchell's History of the Yellow Fever, as it prevailed in Virginia in the years 1737 and 1741, inasmuch as it was part of that clue which led me to adopt one of the remedies on which much of the success of my practice depended.

“The gall bladder (says the doctor) appeared outwardly of a deep yellow, but within was full of black ropy coagulated atrabilis, which sort of substance obstructed the pori biliiarii, and ductus choledochus. This atrabilis was hardly fluid, but upon opening the gall bladder, it retained its form and shape, without being evacuated, being of the consistence of a thin extract, and, within, glutinous and ropy, like soap when boiling. This black matter seemed so much unlike bile, that I doubted if there were any bile in the gall bladder. It more resembled bruised or mortified blood, evacuated from the mortified parts of the liver, surrounding it, although it would stain a knife or probe thrust into it of a yellow colour, which with its ropy consistence, seemed more peculiar to a bilious humour.”

The same appearance of the bile was discovered in several other subjects dissected by Dr. Mitchell.

The liver, in the above-mentioned slave, was turgid and plump on its outside, but on its concave surface, two-thirds of it were of a deep black colour, and round the gall bladder it seemed to be mortified and corrupted.

The duodenum was lined on its inside, near the gall bladder, with a viscid ropy bile, like that which has been described. Its villous coat was lined with a thick fur or slime, which, when scraped or peeled off, the other vascular and muscular coats of the gut appeared red and inflamed.

The omentum was so much wasted, that nothing but its blood-vessels could be perceived.

The stomach was inflamed, both on its outside and inside. It contained a quantity of bile of the same consistence, but of a blacker colour than that which was found in the gall bladder. Its villous coat, like that of the duodenum was covered with fuzzy and slimy matter. It moreover appeared to be distended or swelled. This peculiarity in the inner coat of the stomach was universal in all the bodies that were opened, of persons who died of this disease

The lungs, instead of being collapsed, were inflated as in inspiration. They were all over full of black or livid spots. On these spots were to be seen small vesicles or blisters, like those of an erysipelas or gangrene, containing a yellow humour.

The blood-vessels in general seemed empty of blood, even the vena cava and its branches; but the vena portarum was full and distended as usual. The blood seemed *collected* in the *viscera*; for upon cutting the lungs, or sound liver or spleen, they bled freely.

The brain was not opened in this body, but it was not affected in three others whose brains were examined.

Dr. Mackittrick, in his inaugural dissertation, published at Edinburgh in the year 1766, "*De Febre Indiæ Occidentalis, Maligna Flava*," or upon the yellow fever of the West-Indies, says, that in some of the patients who died of it, he found the liver splacelated, the gall bladder full of black bile, and the veins turgid with black fluid blood. In others he found the liver no ways enlarged, and its "texture only vitiated." The stomach, the duodenum, and ilium, were remarkably inflamed in all cases. The pericardium contained a viscid yellow serum, and a larger quantity than common. The urinary bladder was a little inflamed. The lungs were sound.

Dr. Hume, in describing the yellow fever of Jamaica, informs us, that in several dead bodies which he opened, he found the liver enlarged and turbid with bile, and of a pale yellow colour. In some he found the stomach and duodenum inflamed. In one case he discovered black spots in the stomach, of the size of a crown piece. To this account he adds, "that he had seen some subjects opened, on whose stomachs *no marks of inflammation* could be discovered; and yet these had excessive vomiting."

Dr. Lind has furnished us with an account of the state of the body after death, in his short history of the yellow fever, which prevailed at Cadiz, in the year 1764. "The stomach (he says,) mesentery, and intestines, were covered with gangrenous spots; there were ulcers on the orifice of the stomach, and the liver and lungs were of a putrid colour and texture."*

To these accounts of the morbid appearances of the body after death from the yellow fever, I shall only add the ac-

* Diseases of Warm Climates, p. 125.

count of several dissections, which was given to the public in Mr. Brown's Gazette, during the prevalence of this epidemic, by Dr. Physick and Dr. Cathrall.

"Being well assured of the great importance of dissections of morbid bodies in the investigation of the nature of diseases, we have thought it of consequence that some of those dead of the present prevailing malignant fever should be examined; and, without enlarging on our observations, it appears at present sufficient to state the following facts.

"1st. That the brain in all parts has been found in a natural condition.

"2d. That the viscera of the thorax are perfectly sound. The blood, however, in the heart and veins is fluid, similar, in its consistence, to the blood of persons who have been hanged, or destroyed by electricity.

"3d. That the stomach, and beginning of the duodenum, are the parts that appear most diseased. In two persons who died of the disease on the 5th day, the villous membrane of the stomach, especially about its smaller end, was found highly inflamed; and this inflammation extended through the pylorus into the duodenum, some way. The inflammation here was exactly similar to that induced in the stomach by acrid poisons, as by arsenic, which we have once had an opportunity of seeing in a person destroyed by it.

"The bile in the gall-bladder was quite of its natural colour, though very viscid.

"In another person who died on the 8th day of the disease, several spots of extravasation were discovered between the membranes, particularly about the smaller end of the stomach, the inflammation of which had considerably abated. Pus was seen in the beginning of the duodenum, and the villous membrane at this part was thickened.

"In two other persons, who died at a more advanced period of the disease, the stomach appeared spotted in many places with extravasations, and the inflammation disappeared. It contained, as did also the intestines, a black liquor, which had been vomited and purged before death. This black liquor appears clearly to be an altered secretion from the liver; for a fluid in all respects of the same quality was found in the gall-bladder. This liquor was so acrid, that it induced considerable inflammation and swelling on the

operator's hands, which remained some days. The villous membrane of the intestines, in these last two bodies, was found inflamed in several places.

"The liver was of its natural appearance, excepting in one of the last persons, on the surface of which a very few distended veins were seen: all the other abdominal viscera were of a healthy appearance.

"The external surface of the stomach, as well as of the intestines, was quite free from inflammation; the veins being distended with blood, which appeared through the transparent peritoneum, gave them a dark colour.

"The stomach of those who died early in the disease was always contracted; but in those who died at a more advanced period of it, where extravasations appeared, it was distended with air.

"P. S. PHYSICK,
"J. CATHRALL."

I have before remarked, that these dissections were made early in the disease, and that Dr. Annan attended a dissection of a body at Bush-hill, some time afterwards, in which an unusual turgescence appeared in the vessels of the brain.

Thus far have I delivered the history of the yellow fever, as it affected the human body with sickness and death. I shall now mention a few of those circumstances of public and private distress which attended it. I have before remarked, that the first reports of the existence of this fever were treated with neglect or contempt. A strange apathy pervaded all classes of people. While I bore my share of reproach for "terrifying our citizens with imaginary danger," I answered it by lamenting "that they were not terrified enough." The publication from the college of physicians soon dissipated this indifference and incredulity. Fear or terror now sat upon every countenance. The disease appeared in many parts of the town, remote from the spot where it originated; although, for awhile, in every instance, it was easily traced to it. This set the city in motion. The streets and roads leading from the city were crowded with families flying in every direction for safety to the country. Business began to languish. Water-street, between Market and Race-streets, became a desert. The poor were the first victims of the fever. From the sudden interruption of

business they suffered for a while from poverty as well as from disease. A large and airy house at Bush-hill, about a mile from the city was opened for their reception. This house, after it became the charge of a committee appointed by the citizens on the 14th of September, was regulated and governed with the order and cleanliness of an old and established hospital. An American and French physician had the exclusive medical care of it after the 22d of September.

The disease, after the second week in September, spared no rank of citizens. Whole families were confined by it. There was a deficiency of nurses for the sick, and many of those who were employed were unqualified for their business. There was likewise a great deficiency of physicians from the desertion of some, and the sickness and death of others. At one time there were but three physicians who were able to do business out of their houses, and at this time there were probably not less than 6000 persons ill with the fever.

During the first three or four weeks of the prevalence of the disease I seldom went into a house the first time without meeting the parents or children of the sick in tears. Many wept aloud in my entry or parlour, who came to ask for advice for their relations. Grief after a while descended below weeping, and I was much struck in observing that many persons submitted to the loss of relations and friends without shedding a tear, or manifesting any other of the common signs of grief.

A cheerful countenance was scarcely to be seen in the city for six weeks. I recollect once, in entering the house of a poor man, to have met a child of two years old that smiled in my face. I was strangely affected with this sight (so discordant to my feelings and the state of the city) before I recollected the age and ignorance of the child. I was confined the next day by an attack of the fever, and was sorry to hear, upon my recovery, that the father and mother of this little creature died a few days after my last visit to them.

The streets every where discovered marks of the distress that pervaded the city. More than one half the houses were shut up, although not more than one third of the inhabitants had fled into the country. In walking for many hundred

yards, few persons were met, except such as were in quest of a physician, a nurse, a bleeder, or the men who buried the dead. The hearse alone kept up the remembrance of the noise of carriages or carts in the streets. Funeral processions were laid aside. A black man, leading or driving a horse, with a corpse on a pair of chair wheels, with now and then half a dozen relations or friends following at a distance from it, met the eye in most of the streets of the city, at every hour of the day, while the noise of the same wheels passing slowly over the pavements, kept alive anguish and fear in the sick and well, every hour of the night.*

But a more serious source of the distress of the city arose from the dissensions of the physicians, about the nature and treatment of the fever. It was considered by some as a modification of the influenza, and by others as the jail fever. Its various grades and symptoms were considered as so many different diseases, all originating from different causes. There was the same contrariety in the practice of the physicians that there was in their principles. The newspapers conveyed accounts of both to the public, every day. The minds of the citizens were distracted by them, and hundreds suffered and died from the delays which were produced by an erroneous opinion of a plurality of diseases in the city, or by indecision in the choice, or a want of confidence in the remedies of their physician.

The science of medicine is related to every thing, and the philosopher as well as the Christian will be gratified by knowing the effects of a great and mortal epidemic upon the morals of a people. It was some alleviation of the

* In the life of Thomas Story, a celebrated preacher among the friends, there is an account of the distress of the city, in its infant state, from the prevalence of the yellow fever, in the autumn of 1699, nearly like that which has been described. I shall insert the account in his own words. "Great was the fear that fell on all flesh. I saw no lofty or airy countenance, nor heard any vain jesting to move men to laughter. Every face gathered paleness, and many hearts were humbled, and countenances fallen and sunk, as such that waited every moment to be summoned to the bar, and numbered to the grave." The same author adds, that six, seven, and sometimes eight, died of this fever in a day, for several weeks. His fellow traveller, and companion in the ministry, Roger Gill, discovered upon this occasion an extraordinary degree of Christian philanthropy. He publicly offered himself in one of the meetings of the society, as a sacrifice for the people, and prayed that "God would please to accept of his life for them, that a stop might be put to the contagion" He died of the fever a few days afterwards.

distress produced by it, to observe its influence upon the obligations of morality and religion. It was remarked during this time, by many people, that the name of the Supreme Being was seldom profaned, either in the streets, or in the intercourse of the citizens with each other. But two robberies, and those of a trifling nature, occurred in nearly two months, although many hundred houses were exposed to plunder, every hour of the day and night. Many of the religious societies met two or three times a week, and some of them every evening, to implore the interposition of Heaven to save the city from desolation. Humanity and charity kept pace with devotion. The public have already seen accounts of their benevolent exercises in other publications. It was my lot to witness the uncommon activity of those virtues upon a smaller scale. I saw little to blame, but much to admire and praise in persons of different professions, both sexes, and of all colours. It would be foreign to the design of this work to draw from the obscurity which they sought, the many acts of humanity and charity, of fortitude, patience, and perseverance, which came under my notice. They will be made public and applauded elsewhere.

But the virtues which were excited by our calamity were not confined to the city of Philadelphia. The United States wept for the distresses of their capital. In several of the states, and in many cities and villages, days of humiliation and prayer were set apart to supplicate the Father of Mercies in behalf of our afflicted city. Nor was this all. From nearly every state in the union the most liberal contributions of money, provisions, and fuel were poured in for the relief and support of such as had been reduced to want by the suspension of business, as well as by sickness and the death of friends.

The number of deaths between the 1st of August and the 9th of November amounted to four thousand and forty-four. I shall here insert a register of the number which occurred on each day, beginning on the 1st of August, and ending on the 9th of November. By comparing it with the register of the weather it will show the influence of the latter on the disease. Several of the deaths in August were from other acute diseases, and a few in the succeeding months were from such as were of a chronic nature.

		died.		died.
August	1	9	Brought forward	456
	2	8	September	8
	3	9		9
	4	10		10
	5	10		11
	6	3		12
	7	12		13
	8	5		14
	9	11		15
	10	6		16
	11	7		17
	12	5		18
	13	11		19
	14	4		20
	15	9		21
	16	7		22
	17	6		23
	18	5		24
	19	9		25
	20	7		26
	21	8		27
	22	13		28
	23	10		29
	24	17		30
	25	12	October	1
	26	17		2
	27	12		3
	28	22		4
	29	24		5
	30	20		6
	31	17		7
September	1	17		8
	2	18		9
	3	11		10
	4	23		11
	5	20		12
	6	24		13
	7	18		14
		456		2972

	died.		died.
Brought forward	2972	Brought forward	3685
October	15	October	28
	16		29
	17		30
	18		31
	19	November	1
	20		2
	21		3
	22		4
	23		5
	24		6
	25		7
	26		8
	27		9
	<hr/>		<hr/>
	3685	Total*	3881
	<hr/>		<hr/>

From this table it appears that the principal mortality was in the second week of October. A general expectation had obtained, that cold weather was as fatal to this fever as heavy rains. The usual time for its arrival had come, but the weather was still not only moderate, but warm. In this awful situation, the stoutest hearts began to fail. Hope sickened, and despair succeeded distress in almost every countenance. On the *fifteenth* of October, it pleased God to alter the state of the air. The clouds at last dropped health in showers of rain, which continued during the whole day, and which were succeeded for several nights afterwards by cold and frost. The effects of this change in the weather appeared first in the sudden diminution of the sick, for the deaths continued for a week afterwards to be numerous, but they were of persons who had been confined before, or on the day in which the change had taken place in the weather.

The appearance of this rain was like a dove with an olive branch in its mouth to the whole city. Public notice was given of its beneficial effects, in a letter subscribed by the mayor of Philadelphia, who acted as president of the com-

* In the above accounts there is a deficiency of returns from several graveyards of 163.

mittee, to the mayor of New-York. I shall insert the whole of this letter. It contains, besides the above information, a record of the liberality of the city to the distressed inhabitants of Philadelphia.

“ SIR,

“ I am favoured with your letter of the 12th instant, which I have communicated to the committee for the relief of the poor and afflicted of this city.

“ It is with peculiar satisfaction that I execute their request, by making in their name, on behalf of our suffering fellow-citizens, the most grateful acknowledgments for the seasonable benevolence of the common council of the city of New-York. Their sympathy is balm to our wounds.

“ We acknowledge the Divine interposition, whereby the hearts of so many around us have been touched with our distress, and have united in our relief.

“ May the Almighty Disposer of all events be graciously pleased to protect your citizens from the dreadful calamity with which we are now visited ; whilst we humbly kiss the rod, and improve by the dispensation.

“ The part, sir, which you personally take in our afflictions, and which you have so pathetically expressed in your letter, excites in the breasts of the committee the warmest sensations of fraternal affection.

“ The refreshing rain which fell the day before yesterday, though light, and the cool weather which hath succeeded, appear to have given a check to the prevalence of the disorder : of this we have satisfactory proofs, as well in the decrease of the funerals, as in the applications for removal to the hospital.

“ I have, at your request, this day drawn upon you, at sight, in favour of the president and directors of the Bank of North America, for the sum of five thousand dollars, the benevolent donations of the common council of the city of New-York.

“ With sentiments of the greatest esteem and regard,

“ I am, sir,

“ Your most obedient humble servant,

“ MATTH. CLARKSON.

“ *Philadelphia, Oct. 17, 1793.*

“ RICHARD VARICK, Mayor of the city of New-York ”

It is no new thing for bilious fevers, of every description to be checked or subdued by *wet* and *cold* weather.

The yellow fever which raged in Philadelphia in 1699, and which is taken notice of by Thomas Story in his journal, ceased about the latter end of October, or the beginning of November. Of this there are satisfactory proofs, in the register of the interments in the Friends' burying-ground, and in a letter dated November 9th, old style, 1699, from Isaac Norris to one of his correspondents, which his grandson, Mr. Joseph P. Norris, politely put into my hands, with several others, which mention the disease, and all written in that memorable year in Philadelphia. The letter says, "It has pleased God to put a stop to our sore visitation, and town and country are now generally healthy." The same disease was checked by wet and cold weather in the year 1741. Of this there is a proof in a letter from Dr. Franklin to one of his brothers, who stopped at Burlington, on his way from Boston to Philadelphia, on account of the fever, until he was assured by the Doctor, that a thunder gust, which had cooled the air, had rendered it safe for him to come into the city.* Mr. Lynford Lardner, in a letter to one of his English friends, dated September 24, 1747, old style, after mentioning the prevalence of the fever, in the city, says, "the weather is now much cooler, and those under the disorder revive. The symptoms are less violent, and the fever gradually abates."

I have in vain attempted to procure an account of the time of the commencement of cold weather in the autumn of 1762. In the short history of the fever of that year, which I have inserted from my note book, I have said that it continued to prevail in the months of November and December. The register of the interments in the Friends' burying-ground in those months confirms that account. They were nearly as numerous in November and December as in September and October, viz. in September 22, in October 27, in November 19, and in December 26.

* From a short note in the register of the interments in the Friends' burying-ground, it appears that the fever this year made its first appearance in the month of June. The following is a copy of that note: "12th of the 6th month (O. S.) 1741, a malignant yellow fever now spreads much." Besides that note, there is the following: "25th of the 7th month (O. S.) 1741, many who died of the above distemper were persons lively, and strong, and in the prime of their time."

The bilious remitting fever of 1780 yielded to cool weather, accompanied by rain and easterly wind.

Sir John Pringle will furnish ample satisfaction to such of my readers as wish for more proofs of the efficacy of heavy rains, and cold weather, in checking the progress and violence of autumnal remitting fevers.*

From the 15th of October the disease not only declined, but assumed more obvious inflammatory symptoms. It was as in the beginning, more necessarily fatal where left to itself, but it yielded more certainly to art than it did a few weeks before. The duration of it was now more tedious than in the warm weather.

There were a few cases of yellow fever in November and December, after the citizens who had retired to the country returned to the city.

I heard of but three persons who returned to the city being infected with the disease; so completely was its cause destroyed in the course of a few weeks.

In consequence of a proclamation by the governor, and a recommendation by the clergy of Philadelphia, the 12th of December was observed as a day of thanksgiving throughout the state, for the extinction of the disease in the city.

It was easy to distinguish, in walking the streets, the persons who had returned from the country to the city, from those who had remained in it during the prevalence of the fever. The former appeared ruddy and healthy, while the latter appeared of a pale sallow colour.

It afforded a subject of equal surprise and joy to behold the suddenness with which the city recovered its former habits of business. In the course of six weeks after the disease had ceased, nothing but fresh graves, and the black dresses of many of the citizens, afforded a public trace of the distress which had so lately prevailed in the city.

The month of November, and all the winter months which followed the autumnal epidemic, were in general healthy. A catarrh affected a number of people in November. I suspected it to be the influenza which had revived from a dormant state, and which had not spent itself, when it yielded to the predominance of the yellow fever. This opinion derives some support from a curious fact related by

* p. 5, 56, 108, and 323.

the late Mr. Hunter of the revival of the small-pox in a patient, in whom it had been suspended for some time by the measles.* The few fevers which prevailed in the winter were highly inflammatory. The small-pox in the natural way was in several instances confluent; and in one or two fatal. I was prepared to expect this inflammatory diathesis in the fevers of the winter; for I had been taught by Dr. Sydenham, that the diseases which follow a great and mortal epidemic partake more or less of its general character. But the diseases of the winter had a peculiarity still more extraordinary; and that was, many of them had several of the symptoms of the yellow fever, particularly a puking of bile, dark-coloured stools, and a yellow eye. Mr. Samuel D. Alexander, a student of medicine from South-Carolina, who was seized with a pneumony about Christmas, had, with a yellow eye, a dilated pupil and a hard pulse, which beat only fifty strokes in a minute. His blood was such as I had frequently observed in the yellow fever. Dr. Griffiths informed me that he attended a patient on the 9th of January, in a pneumony, who had an universal yellowness on his skin. I met with a case of pneumony on the 20th of the same month, in which I observed the same degrees of redness in the eyes that were common in the yellow fever. My pupil, Mr. Coxe, lost blood in an inflammatory fever, on the 18th of February, which was dissolved. Mr. Innes, the brewer, had a deep yellow colour in his eyes on the fourth day of a pneumony, on the 27th of the same month; and Mr. Magnus Miller had the same symptom of a similar disease on the 16th of March. None of these bilious and anomalous symptoms of the inflammatory fevers of the winter and spring surprised me. I had been early taught by Dr. Sydenham that the epidemics of autumn often insinuate some of their symptoms into the winter diseases which follow them. Dr. Cleghorn informs us, that "the pleurisies which succeeded the autumnal tertians in Minorca, were accompanied by a vomiting and purging of green or yellow bilious matters."†

It belongs to powerful epidemics to be followed by similar diseases after they disappear, as well as to run into others at their first appearance. In the former case it is

* Introduction to a Treatise on the Venereal Disease, p. 3, of the American edition.

† Page 273.

occasioned by a peculiar state of the body, created by the epidemic constitution of the air, not having been changed by the weather which succeeded it.

The weather in March resembled that of May ; while the weather in April resembled that of March in common years. A rash prevailed in many families, in April, accompanied in a few cases by a sore throat. It was attended with an itching, a redness of the eyes, and a slight fever in a few instances. The small-pox by inoculation in this month was more mortal than in former years. However unimportant these facts may appear at this time, future observations may perhaps connect them with a similar constitution of the air which produced the previous autumnal epidemic.

The appearance of bilious symptoms in the diseases of the winter, excited apprehensions in several instances of the revival of the yellow fever. The alarms, though false, served to produce vigilance and industry in the corporation, in airing and purifying such houses and articles of furniture as belonged to the poor ; and which had been neglected in the autumn, after the ceasing of the disease.

The modes of purifying houses, beds, and clothes were various. Fumigations of nitre and aromatic substances were used by some people. Burying infected articles of furniture under ground, and baking them in ovens, were used by others. Some destroyed all their beds and clothing that had been infected, or threw them into the Delaware. Many white-washed their walls, and painted the wood-work of their house. I did not conceive the seeds of the disease required all, or any of those means to destroy it. I believed *cold* and *water* to be sufficient for that purpose. I therefore advised keeping the windows of infected rooms open night and day, for a few days ; to have the floors and walls of houses well washed ; and to expose beds and such articles of household furniture as might be injured by washing, upon the bare earth for a week or two, taking care to turn them every day. I used no other methods of destroying the accumulated miasmata in my house and furniture, and experience showed that they were sufficient.

It is possible a portion of the excretions of the sick may be retained in clothes or beds, so as to afford an exhalation that may in the course of a succeeding summer and autumn,

or from accidental warmth at any time, create a solitary case of fever, but it cannot render it epidemic. A trunk full of clothes, the property of Mr. James Bingham, who died of the yellow fever in one of the West-India Islands, about 50 years ago, were opened, some months after they were received by his friends, by a young man who lived in his brother's family. This young man took the disease, and died; but without infecting any of the family; nor did the disease spread afterwards in the city. The father of Mr. Joseph Paschall was infected with the yellow fever of 1741, by the smell of a foul bed in passing through Norris's Alley, in the latter end of December, after the disease had left the city. He died on the 25th of the month, but without reviving the fever in the city, or even infecting his family.

The matter which produced the fever in both these cases, had nothing specific in it. It acted in the same manner that the exhalation from any other putrid matters would have done in a highly concentrated state.

In a letter from Dr. Senter of Newport, dated January 7th, 1794, I find the following fact, which I shall communicate in his own words. It is introduced to support the principle, that the yellow fever does not spread by contagion. "This place (says the doctor) has traded formerly very much to the West-India Islands, and more or less of our people have died there every season, when the disease prevails in those parts. Clothes of these unfortunate people have been repeatedly brought home to their friends, without any accident happening to them."

I feel with my reader the fatigue of this long detail of facts, and equal impatience with him to proceed to the history of the treatment of the fever; but I must beg leave to detain him a little longer from that part of the work, while I resume the subject of the origin of the fever. It is an interesting question, as it involves in it the means of preventing the return of the disease, and thereby of saving the lives of thousands of our citizens.

Soon after the fever left the city, the governor of the state addressed a letter to the college of physicians, requesting to know their opinion of its origin; if imported, from what *place*, at what *time*, and in what *manner*. The design of this inquiry was to procure such information as was proper to lay before the legislature, in order to improve the laws

for preventing the importation or generation of infectious diseases, or to enact new ones, if necessary for that purpose. To the governor's letter the college of physicians sent the following answer :

“ SIR,

“ It has not been from a want of respect to yourself, nor from inattention to the subject, that your letter of the 30th ult. was not sooner answered ; but the importance of the questions proposed has made it necessary for us to devote a considerable portion of time and attention to the subject, in order to arrive at a safe and just conclusion.

“ No instance has ever occurred of the disease called the *yellow fever* having been generated in this city, or in any other parts of the United States, as far as we know ; but there have been frequent instances of its having been imported, not only into this, but into other parts of North America, and prevailing there for a certain period of time ; and from the rise, progress, and nature of the malignant fever, which began to prevail here about the beginning of last August, and extended itself gradually over a great part of the city, we are of opinion that this disease was imported into Philadelphia, by some of the vessels which arrived in the port after the middle of July. This opinion we are further confirmed in by various accounts we have received from unquestionable authorities.

“ Signed, by order of the college of physicians,

“ JOHN REDMAN, *President.*

“ *November 26th, 1793.*”

“ *To the governor of Pennsylvania.*”

Dr. Redman, the president of the college, Dr. Foulke, and Dr. Leib, dissented from the report contained in this letter. I have been necessarily led to continue it in the present edition of this work, not only because all the other members of that body still retain their belief of the importation of the fever, but as a reason for republishing the facts and arguments in support of its domestic origin.

I have asserted, in the introduction to the history of this

fever, that I believed it to have been generated in our city ; I shall now deliver my reasons for that belief.

1. The yellow fever in the West-Indies, and in all other countries where it is endemic, is the offspring of vegetable putrefaction. Heat, exercise, and intemperance in drinking (says Dr. Lind) *dispose* to this fever in hot climates, but they do not produce it without the concurrence of a remote cause. This remote cause exists at all times, in some spots of the islands, but in other parts even of the same islands, where there are no marsh exhalations, the disease is unknown. I shall not waste a moment in inquiring into the truth of Dr. Warren's account of the origin of this fever. It is fully refuted by Dr. Hillary, and it is treated as chimerical by Dr. Lind. They have very limited ideas of the history of this fever, who suppose it to be peculiar to the East or West-Indies. It was admitted to have been generated in Cadiz after a hot and dry summer in 1764, and in Pensacola in 1765.* The tertian fever of Minorca, when it attacked Englishmen, put on the usual symptoms of the yellow fever.† In short, this disease appears, according to Dr. Lind, in all the southern parts of Europe, after hot and dry weather.‡

2. The same causes (under like circumstances) must always produce the same effects. There is nothing in the air of the West-Indies, above other hot countries, which disposes it to produce a yellow fever. Similar degrees of heat, acting upon dead and moist vegetable matters, are capable of producing it, together with all its various modifications, in every part of the world. In support of this opinion, I shall transcribe part of a letter from Dr. Miller, formerly of the Delaware state, and now of New-York.

Dover, Nov. 5, 1793.

“DEAR SIR,

“SINCE the middle of last July we have had a bilious colic epidemic in this neighbourhood, which exhibits phenomena very singular in this climate ; and, so far as I am informed, unprecedented in the medical records, or popular traditions of this country. To avoid unnecessary details it will suffice at present to observe, that the

* Lind on the Diseases of Hot Climates, p. 36 and 124.

† Cleghorn, p. 176.

‡ Diseases of Hot Climates, p. 123

disease, on this occasion, has assumed not only all the essential characters, but likewise all the violence, obstinacy and malignity described by the East and West Indian practitioners. If any difference can be observed, it seems here to manifest higher degrees of stubbornness and malignity than we usually meet in the histories of tropical writers. In the course of the disease, not only extreme constipation, frequent vomiting, and the most excruciating pains of the bowels and limbs, harass the unhappy patient; but to these succeeded paralysis, convulsions, &c.; and almost always uncommon muscular debility, oppression of the præcordia, &c. are the consequence of a severe attack. Bile discharged in enormous quantities constantly assumes the most corrupted and acrimonious appearances, commonly æruginous in a very high degree, and sometimes quite atrabilious.

“The inference I mean to draw from the phenomena of this disease, as it appears in this neighbourhood, and which I presume will also apply to your epidemic, is *this*, that from the uncommon protraction and intenseness of our summer and autumnal heats, but principally from the unusual drought, we have had, since the middle of July, a near approach to a *tropical* season, and that of consequence we ought not to be surprised if tropical diseases, even of the most malignant nature, are *engendered* amongst us.”

To the above information it may be added, that the dysentery which prevailed during the autumn of 1793, in several of the villages of Pennsylvania, was attended with a malignity and mortality unknown before in any part of the state. I need not pause to remark that this dysentery arose from putrid exhalation, and that it is, like the bilious colic, only a modification of bilious fever.

But further, a malignant fever, resembling that which was epidemic in our city, prevailed during the autumn in many parts of the United States, viz. at Lynn in Massachusetts, at Weatherfield and Coventry in Connecticut, at New-Galloway in the state of New-York, on Walkill, and on Pensocken creeks in New-Jersey, at Harrisburg and Hummelstown in Pennsylvania, in Caroline county in Maryland, on the south branch of the Potowmac in Hardie county, also in Lynchburgh and in Alexandria in Virginia, and in several counties in North-Carolina. In none of

these places was there a suspicion of the disease being imported from abroad, or conveyed by an intercourse with the city of Philadelphia.

It is no objection to the inference which follows from these facts, that the common remitting fever was not known during the above period in the neighbourhood of this city, and in many other parts of the state, where it had usually appeared in the autumnal months. There is a certain combination of moisture with heat, which is essential to the production of the remote cause of a bilious fever. Where the heat is so intense, or of such long duration, as wholly to dissipate moisture, or when the rains are so great as totally to overflow the marshy ground, or to wash away putrid masses of matter, no fever can be produced.

Dr. Dazilles, in his treatise upon the diseases of the negroes in the West-Indies, informs us, that the *rainy* season is the most healthy at Cayenne, owing to the neighbouring morasses being *deeply* overflowed ; whereas, at St. Domingo, a *dry* season is most productive of diseases, owing to its favouring those degrees of moisture which produce morbid exhalations. These facts will explain the reason why, in certain seasons, places which are naturally healthy in our country become sickly, while those places which are naturally sickly escape the prevailing epidemic. Previously to the dissipation of the moisture from the putrid masses of vegetable matters in other streets, and in the neighbourhood of the city, there were (as several practitioners can testify) many cases of mild remittents, but they all disappeared about the first week in September.

It is worthy of notice, that the yellow fever prevailed in Virginia in the year 1741, and in Charleston, in South-Carolina, in the year 1699, in both which years it prevailed in Philadelphia. Its prevalence in Charleston is taken notice of in a letter, dated November 18th, O. S. 1699, from Isaac Norris to one of his correspondents. The letter says that “ 150 persons had died in Charleston in a few days,” that “ the survivors fled into the country,” and that “ the town was thinned to a very few people.” It is not probable, from the prevalence of this fever twice in two places in the same years, that it was produced (as in 1793) by a general constitution of air, co-operating with miasmata, which favoured its generation in different parts of the

continent? But again, such was the state of the air, in the summer of 1793, that it predisposed other animals to diseases, besides the human species. In some parts of New-Jersey, a disease prevailed with great mortality among the horses, and in Virginia among the cows, during the autumn. The urine in both was yellow.—Large abscesses appeared in different parts of the body in the latter animals, which, when opened, discharged a yellow serous fluid. From the colour of these discharges, and of the urine, the disease got the name of the *yellow water*.

3. I have before remarked, that a quantity of damaged coffee was exposed at a time (July the 24th) and in a situation (on a wharf and in a dock) which favoured its putrefaction and exhalation. Its smell was highly putrid and offensive, insomuch that the inhabitants of the houses in Water and Front-streets, who were near it, were obliged, in the hottest weather, to exclude it by shutting their doors and windows. Even persons who only walked along those streets complained of an intolerable fœtor, which, upon inquiring, was constantly traced to the putrid coffee. It should not surprise us, that this seed, so inoffensive in its natural state, should produce, after its putrefaction, a violent fever. The records of medicine (to be mentioned hereafter) furnish instances of similar fevers being produced by the putrefaction of many other vegetable substances.

4. The rapid progress of the fever from Water-street, and the courses through which it travelled into other parts of the city, afford a strong evidence that it was at first propagated by exhalation from the putrid coffee. It was observed that it passed first through those alleys and streets which were in the course of the winds that blew across the dock and wharf, where the coffee had been thrown in a state of putrefaction.

5. Many persons who had worked, or even visited, in the neighbourhood of the exhalation from the coffee, early in the month of August, were indisposed afterwards with sickness, puking, and yellow sweats, long before the air of Water-street was so much impregnated with the exhalation, as to produce such effects; and several patients, whom I attended in the yellow fever, declared to me, or to their friends, that their indispositions began exactly at the time they inhaled the offensive effluvia of the coffee.

6. The first cases of the yellow fever have been clearly traced to the sailors of the vessel who were first exposed to the effluvia of the coffee. Their sickness commenced with the day on which the coffee began to emit its putrid smell. The disease spread with the increase of the poisonous exhalation. A journeyman of Mr. Peter Brown, who worked near the corner of Race and Water-streets, caught the disease on the 27th of July. Elizabeth Hill, the wife of a fisherman, was infected by only sailing near the pestilential wharf, about the 1st of August, and died at Kensington on the 14th of the same month. Many other names might be mentioned of persons who sickened during the last week in July or the first week in August, who ascribed their illness to the smell of the coffee.

7. It has been remarked that this fever did not spread in the country, when carried there by persons who were infected, and who afterwards died with it. During four times in which it prevailed in Charleston, in no one instance, according to Dr. Lining, was it propagated in any other part of the state.

8. In the histories of the disease which have been preserved in this country, it has *six* times appeared about the first or middle of August, and declined or ceased about the middle of October: viz. in 1732, 1739, 1745, and 1748 in Charleston, in 1791 in New-York, and in 1793 in Philadelphia. This frequent occurrence of the yellow fever at the usual period of our common bilious remittents, cannot be ascribed to accidental coincidence, but must be resolved, in most cases, into the combination of more active miasmata with the predisposition of a tropical season. In speaking of a tropical season, I include that kind of weather in which rains and heats are alternated with each other, as well as that which is uniformly warm.

9. Several circumstances attended this epidemic, which do not occur in the West-India yellow fever. It affected children as well as adults, in common with our annual bilious fevers. In the West-Indies, Dr. Hume tells us, it never attacked any person under puberty. It had moreover, many peculiar symptoms (as I have already shown) which are not to be met with in any of the histories of the West-India yellow fever.

10. Why should it surprise us to see a yellow fever

generated amongst us? It is only a higher grade of a fever which prevails every year in our city, from vegetable putrefaction. It conforms, in the difference of its degrees of violence and danger to season as well as climate, and in this respect it is upon a footing with the small-pox, the measles, the sore throat, and several other diseases. There are few years pass, in which a plethoric habit, and more active but limited miasmata, do not produce sporadic cases of true yellow fever in Philadelphia. It is very common in South and North-Carolina and in Virginia, and there are facts which prove, that not only strangers, but native individuals, and in one instance, a whole family, have been carried off by it in the state of Maryland. It proved fatal to one hundred persons in the city of New-York, in the year of 1791, where it was evidently generated by putrid exhalation. The yellow colour of the skin has unfortunately too often been considered as the characteristic mark of this fever, otherwise many other instances of its prevalence might be discovered, I have no doubt, in every part of the United States. I wish, with Dr. Mosely, the term *yellow* could be abolished from the titles of this fever, for this colour is not only frequently absent, but sometimes occurs in the mildest bilious remittents. Dr. Haller, in his pathology, describes an epidemic of this kind in Switzerland, in which this colour generally attended, and I have once seen it almost universal in a common bilious fever, which prevailed in the American army, in the year 1776.

I cannot help taking notice, in this place, of an omission in the answer to the governor's letter, by the college of physicians. The governor requested to know whether it was imported; if it were, from *what place*, at *what time*, and in *what manner*. In the answer of the college of physicians to the governor's letter no notice was taken of any of those questions. In vain did Dr. Foulke call upon the college to be more definite in their answer to them. They had faithfully sought for the information required, but to no purpose. The character of their departed brother, Dr. Hutchinson, for capacity and vigilance in his office, as inspector of sickly vessels, was urged without effect as an argument against the probability of the disease being imported. Public report had derived it from several different islands; had chased it from ship to ship, and from shore to

shore, and finally conveyed it at different times into the city, alternately by dead and living bodies; and from these tales, all of which when investigated, were proved to be without foundation, the college of physicians composed their letter. It would seem, from this conduct of the college, as if medical superstition had changed its names, and that, in accounting for the origin of pestilential fevers, celestial, planetary, and demoniacal influence had only yielded to the term *importation*.

Let not the reader reject the opinion I have delivered, because it is opposed by so great a majority of the physicians of Philadelphia. A single physician supported an opinion of the existence of the plague at Messina, in the year 1743, in opposition to all the physicians (33 in number) of that city. They denied the disease in question to exist, because it was not accompanied by glandular swellings. Time showed that they were all mistaken, and the plague, which might probably have been checked, at its first appearance, by their united efforts, was, by means of their ignorance, introduced with great mortality into every part of the city. This disposition of physicians to limit the symptoms of several other diseases, cannot be sufficiently lamented. The frequent absence of a yellow colour in this epidemic, led to mistakes which cost the city of Philadelphia several hundred lives.

The letter of the college of physicians has served to confirm me in opinion, that the plagues which occasionally desolated most of the countries of Europe, in former centuries, and which were always said to be of foreign extraction, were of domestic origin. Between the years 1006 and 1680, the plague was epidemic fifty-two times all over Europe. It prevailed fourteen times in the 14th century. The state of Europe in this long period is well known. Idleness, a deficiency of vegetable aliment, a camp life, from the frequency of wars, famine, an uncultivated and marshy soil, small cabins, and the want of cleanliness in dress, diet, and furniture, all concurred to generate pestilential diseases. The plagues which prevailed in London, every year from 1593 to 1611, and from 1636 to 1649, I believe were generated in that city. The diminution of plagues in Europe, more especially in London, appears to have been produced by the great change in the diet and

manners of the people ; also by the more commodious and airy forms of the houses of the poor, among whom the plague *always* makes its first appearance. It is true, these plagues, were said by authors to have been imported, either directly or indirectly, from the Levant ; but the proofs of such importation were as vague and deficient as they were of the West-India origin of our epidemic. The pestilential fevers which have been mentioned, have been described by authors by the generic name of the plague, but they appear to have originated from putrid vegetable exhalations, and to have resembled, in most of their symptoms, the West-India and *North American* yellow fever.

I shall resume this interesting subject in another place, in which I shall mention a number of additional facts, not only in support of the domestic origin of the bilious yellow fever, but of its not spreading by contagion, and of course of its being impossible to import it. I shall at the same time enumerate all its different sources, and point out the means of destroying or removing them, and thus of exterminating the disease from our country.

With these observations I conclude the history of the epidemic fever of the year 1793. A few of its symptoms which have been omitted in this history, will be included in the method of cure, for they were discovered or produced by the remedies which were given for that purpose.

✿ The following page begins an account of the states of the thermometer and weather, from the 1st of January to the 1st of August, and of the states of the barometer, thermometer, winds, and weather, from the 1st of August to the 9th of November, 1793. The times of observation, for the first three months, are at 7 in the morning, and 2 in the afternoon; for the next five months they are at 6 in the morning, and 3 in the afternoon. From the 1st of October to the 9th of November, they are as in the first three months.

*January, 1793.**February, 1793.*

D.	Ther		Weather.		Ther		Weather.
	7h	2h			7h	2h	
1	27	30	Cloudy.		9	26	Fair, hazy.
2	30	41	Fair, cloudy.		25	34	Rain, ditto.
3	30	33	Cloudy, rain.		33	37	Cloudy, fair.
4	38	41	Rain, cloudy.		25	46	Cloudy, fair.
5	35	42	Fair, cloudy.		36	44	Cloudy, ditto.
6	33	47	Cloudy, fair.		35	46	Cloudy, rain.
7	38	51	Fair, fair.		36	40	Cloudy, fair.
8	32	49	Fair, ditto.		28	44	Cloudy, ditto.
9	33	48	Hazy, fair.		42	50	Rain, fair.
10	38	51	Fair, ditto.		38	40	Cloudy, fair.
11	35	48	Fair, clouds.		19	27	Fair, cloudy.
12	31	42	Fair, ditto.		20	28	Snow, cloudy.
13	28	42	Fair, ditto.		22	31	Cloudy, snow.
14	25	27	Hail, snow, sleet.		27	39	Cloudy, fair.
15	32	37	Clouds, mist.		18	40	Fair, ditto.
16	37	39	Rain, ditto.		29	42	Cloudy, ditto.
17	37	45	Rain, snow, fair.		44	48	Rain, ditto.
18	32	52	Fair, ditto.		39	49	Cloudy, fair.
19	37	48	Fair, ditto.		31	41	Cloudy, rain.
20	33	47	Hazy, cloudy,		52	53	Rain, fair.
21	36	47	Cloudy, fair,		37	49	Fair, ditto.
22	27	52	Fair, ditto.		29	34	Fair, ditto.
23	22	37	Fair, ditto.		22	34	Snow, cloudy.
24	30	39	Cloudy, ditto.		54	59	Rain, cloudy.
25	30	41	Fair, hazy.		34	35	Cloudy, ditto.
26	31	—	Fair.		35	43	Rain, mist.
27	23	38	Fair, cloudy, snow.		43	43	Rain, cloudy.
28	35	45	Cloudy, fair.		14	26	Fair, ditto.
29	29	37	Fair, ditto.				
30	22	23	Snow, hail.				
31	25	32	Cloudy, fair.				

*March, 1793.**April, 1793.*

D.	Ther		Weather.		Ther		Weather.
	7h	2h			7h	2h	
1	20	38	Fair, ditto.		45	70	Cloudy, fair.
2	31	51	Hazy, cloudy.		47	71	Fair, ditto.
3	48	63	Rain, fair.		56	80	Fair, ditto.
4	43	61	Hazy, ditto.		51	72	Cloudy, fair.
5	51	52	Rain, fair.		53	61	Cloudy, rain.
6	32	50	Fair, ditto.		60	76	Misty, fair.
7	36	62	Fair, ditto, clouds.		51	65	Fair, ditto.
8	54	60	Cloudy, rain.		46	74	Fair, ditto.
9	26	41	Fair, ditto.		55	71	Fair, cloudy.
10	29	51	Fair, ditto.		50	56	Fair, ditto.
11	43	55	Rain, ditto.		37	63	Fair, ditto.
12	40	43	Cloudy, ditto.		54	62	Cloudy, rain, fair.
13	38	39	Cloudy, fair.		49	62	Fair, ditto.
14	26	44	Fair, ditto.		50	70	Fair, ditto.
15	32	59	Fair, ditto.		45	55	Rain, cloudy.
16	52	62	Cloudy, fair.		46	62	Cloudy, fair.
17	51	72	Cloudy, fair.		48	67	Fair, clouds, fair.
18	58	69	Hazy, cloudy.		52	66	Cloudy, fair.
19	53	59	Fair, ditto.		52	75	Fair, ditto.
20	42	61	Fair, ditto.		52	49	Rain, cloudy.
21	41	43	Rain, cloudy.		44	47	Cloudy, ditto.
22	31	47	Fair, ditto.		43	46	Rain, cloudy.
23	35	57	Fair, ditto.		42	63	Fair, ditto.
24	37	50	Fair, ditto.		44	68	Fair, ditto.
25	35	59	Fair, ditto.		45	65	Cloudy, ditto.
26	47	54	Cloudy, rain.		53	57	Cloudy, rain.
27	43	51	Fair, cloudy.		47	46	Rain, ditto.
28	33	45	Fair, clouds, fair.		44	54	Rain, cloudy.
29	34	57	Fair, ditto.		40	59	Fair, ditto.
30	41	58	Cloudy, fair.		40	65	Fair, ditto.
31	42	61	Cloudy, fair.				

*May, 1793.**June, 1793.*

D.	Ther		Weather.			Ther	Weather.	
	7h	2h						7h
1	45	69	Foggy, cloudy.			53	61	Rain, showery.
2	52	73	Fog, clouds, fair.			54	64	Clouds, showers.
3	60	63	Rain, ditto.			55	62	Cloudy, rain, fair.
4	60	80	Fair, ditto.			54	60	Rain, do. cloudy.
5	55	56	Cloudy, ditto.			58	72	Cloudy, fair, rain.
6	47	58	Cloudy, fair.			—	71	Cloudy, rain.
7	50	68	Cloudy, fair.			68	78	Fair, ditto.
8	59	78	Cloudy, fair.			65	—	Fair, ditto.
9	61	79	Foggy, fair.			70	88	Fog, fair.
10	65	71	Rain, hazy.			74	90	Fair, ditto.
11	55	75	Cloudy, fair.			76	90	Fair, ditto.
12	61	76	Cloudy, rain.			75	88	Fair, showers.
13	57	78	Fair, ditto.			74	81	Cloudy, rain.
14	59	83	Fair, cloudy.			63	77	Fair, ditto.
15	60	71	Fair, ditto.			63	82	Fair, hazy.
16	50	69	Fair, ditto.			67	85	Fair, ditto.
17	48	74	Fair, ditto.			74	89	Fair, showers.
18	61	81	Cloudy, fair.			73	88	Fair, ditto.
19	65	85	Fair, rain.			77	91	Fair, ditto.
20	65	87	Fair, ditto.			79	88	Fair, rain, fair.
21	68	86	Fair, ditto, clouds.			75	85	Cloudy, rain.
22	72	80	Clouds, gusts.			58	78	Cloudy, fair.
23	94	79	Cloudy, fair.			58	78	Fair, ditto.
24	58	75	Fair, ditto.			60	79	Fair, ditto.
25	52	70	Fair, cloudy.			67	74	Cloudy, rain.
26	61	66	Rain, ditto.			66	69	Cloudy, rain.
27	68	84	Cloudy, fair.			68	80	Cloudy, fair.
28	70	68	Fair, clouds, rain.			71	85	Cloudy, fair.
29	57	62	Cloudy, rain, clouds			77	88	Cloudy, ditto.
30	54	57	Cloudy, rain.			74	90	Fair, ditto.
31	54	60	Clouds, ditto.					

JULY, 1793.

Days.	Barom.		Ther.		Winds.		Weather.	
	6 A. M.	3 P. M.	6 A. M.	3 P. M.	6 A. M.	3 P. M.		
1	30	0	29	977	88	W	W	Fair.
2	29	8	29	777	81	W		Fair, showers.
3	22	9	30	074	80	E	E	Cloudy.
4	30	1	30	070	83	E	SW	Cloudy, fair, rain.
5	30	0	29	976	90	NW	SW	Fair, ditto.
6	29	9	29	978	91	SW	SW	Cloudy, thunder.
7	29	9	30	073	88	NE	NW	Fair, clouds.
8	30	1	30	172	85	E	E	Cloudy, fair.
9	30	0	29	873	81	S	SW	Cloudy, ditto.
10	30	0	30	070	84	W	NW	Fair, ditto.
11	30	0	30	074	88	NW	NW	Fair, clouds.
12	30	1	30	270	84	N	N	Fair, ditto.
13	30	1	30	068	83	NW	NW	Fair, ditto.
14	30	0	30	065	80	N	Calm	Fair, hazy.
15	30	0	29	966	75	SW	SW	Cloudy, ditto.
16	29	8	29	770	83	W	W	Rain, fair.
17	29	8	29	968	81	NW	NW	Fair, ditto.
18	30	0	30	066	86	W	SW	Fair, ditto.
19	29	9	29	975	85	SW	W	Fair, cloudy, rain.
20	30	0	30	072	87	W	NW	Fair, ditto, shower.
21	30	1	30	170	86	NW	NW	Fair, ditto.
22	30	0	30	072	87	SW	SW	Fair, ditto.
23	30	0	30	073	91	SW	SW	Fair, cloudy.
24	29	9	29	975	89	Calm	W	Cloudy, fair.
25	30	1	30	171	83	NW	NNW	Fair, ditto.
26	30	2	30	263	82	N	NE	Fair, ditto.
27	30	2	30	164	81	S	Calm	Fair, cloudy.
28	30	1	30	072	85	Calm	NNE	Cloudy, fair.
29	30	1	30	174	85	SSE	NE	Cloudy, ditto, rain.
30	30	1	30	073	86	S	SW	Cloudy, fair.
31	29	9	29	876	80	SSW	SW	Cloudy, rain, fair.

AUGUST, 1793.

Days.	Barom.		Ther.		Winds.		Weather.	
	6 A. M.	3 P. M.	6 A. M.	3 P. M.	6 A. M.	3 P. M.	6 A. M.	3 P. M.
1	29 95	30 0	65 77	WNW	NW	Cloudy,	Fair,	
2	30 1	30 1	63 81	NW	SW	Fair,	Fair,	
3	30 6	29 95	62 82	N	NNE	Fair,	Fair,	
4	29 97	30 0	65 87	S	SW	Fair,	Fair,	
5	30 5	30 1	73 90	SSW	SW	Fair,	Fair,	
6	30 2	30 0	77 87	SW	W	Cloudy,	Fair,	
7	30 12	30 1	68 83	NW	W	Fair,	Fair,	
8	30 1	29 95	69 86	SSE	SSE	Fair,	Rain,	
9	29 8	29 75	75 85	SSW	SW	Cloudy,	Fair,	
10	29 9	29 9	67 82	W	SW	Fair,	Fair,	
11	30 0	30 0	70 84	SW	WSW	Cloudy,	Cloudy,	
12	30 0	30 0	70 87	W	W	Fair,	Fair,	
13	30 5	30 0	71 89	SW	W	Fair,	Fair,	
14	30 0	29 95	75 82	SW	SW	Fair,	Rain,	
15	30 0	30 1	72 75	NNE	NE	Fair,	Cloudy,	
16	30 1	30 1	70 83	NNE	NE	Fair,	Fair,	
17	30 1	30 0	71 86	SW	SW	Fair,	Fair,	
18	30 1	30 1	73 89	Calm	SW	Fair,	Fair,	
19	30 1	30 0	72 82	N	N	Fair,	Cloudy,	
20	30 1	30 12	69 82	NNE	NNE	Fair,	Fair,	
21	30 15	30 25	62 83	N	NNE	Fair,	Fair,	
22	30 3	30 35	63 86	NE	SE	Fair,	Fair,	
23	30 25	30 15	63 85	Calm	S	Fair,	Fair,	
24	30 1	30 1	73 81	Calm	Calm	Cloudy,	Rain,	
25	30 1	30 1	71 66	NE	NE	Rain,	Gr. rain,	
26	30 15	30 2	69 69	NE	NE	Cloudy,	Cloudy,	
27	30 2	30 2	65 73	NE	NE	Cloudy,	Cloudy,	
28	30 2	30 15	67 80	S	Calm	Cloudy,	Clearin.	
29	30 16	30 15	72 86	Calm	SW	Cloudy,	Fair,	
30	30 1	30 1	74 87	Calm	SW	Fair,	Fair,	
31	30 0	30 0	74 84	SW	NW	Rain,	Fair,	

SEPTEMBER, 1793.

Days.	Barom.		Ther.		Winds.		Weather.	
	6 A. M.	3 P. M.	6 A. M.	3 P. M.	6 A. M.	3 P. M.	6 A. M.	3 P. M.
1	30 0	29 30	71	86	Calm	SW	Fog,	Fair,
2	29 75	29 8	73	86	SW	SW	Fair,	Fair,
3	30 0		60		NW	N	Fair,	Fair,
4	30 15	30 15	55	75	W	W	Fair,	Fair,
5	30 15	30 1	62	80	RE	S	Fair,	Cloudy,
6	29 97	29 95	70	89	WSW	W	Fair,	Cloudy,
7	30 0	30 0	65	77	WNW	NW	Fair,	Fair,
8	30 1	30 1	64	70	Calm	Calm	Cloudy,	Cloudy,
9	30 0	30 0	66	80	SE	NW	Rain,	Fair,
10	30 0	30 0	64	72	N	NNE	Fair,	Cloudy,
11	30 1	30 0	62	72	NNE	N	Cloudy,	Fair,
12	29 96	29 9	58	76	NW	NNW	Fair,	Fair,
13	29 95	30 0	57	72	NW	N	Fair,	Fair,
14	30 0	30 5	58	79	NW	NW	Fair,	Fair,
15	30 0	29 97	65	80	N	S	Fair,	Fair,
16	29 9	29 7	70	84	S	SW	Cloudy,	Fair,
17	29 8	29 85	66	67	N	N	Cloudy,	Cloudy,
18	30 3		44		N		Fair,	
19	30 4	30 35	45	70	Calm	SW	Fair,	Fair,
20	30 3	30 15	54	69	Calm	SE	Hazy,	Hazy,
21	30 0	29 0	59	78	Calm		Cloudy,	Fair,
22	30 0	30 0	63	83	Calm		Cloudy,	Fair,
23	30 1	30 1	62	—	Calm	SE	Cloudy,	Cloudy,
24	30 2	30 2	65	70	NE	ENE	Cloudy,	Fair,
25	30 15	30 0	61	68	NE	NE	Cloudy,	Cloudy,
26	29 8	29 7	58	79	N	N	Cloudy,	Fair,
27	20 7		64		NW	NW	Cloudy,	Fair,
28	30 5	30 15	54	73	NW	NW	Fair,	Fair,
29	30 3	30 3	56	74	NE	ENE	Cloudy,	Fair,
30	30 35	30 3	57	75	Calm	SW	Foggy,	Fair,

OCTOBER, 1793.

Days.	Barom.		Ther.		Winds.		Weather.	
	7 A. M.	2 P. M.	7 A. M.	2 P. M.	7 P. M.	2 P. M.	7 A. M.	2 P. M.
1	30 15	30 5	64 80	SW	SW	SW	Cloudy,	Fair,
2	29 9	30 5	70 72	W	NNW	NNW	Cloudy,	Fair,
3	30 2	30 15	50 72	W	SW	SW	Fair,	Fair,
4	29 75	29 7	59 72	SW	W	W	Cloudy,	Cloudy,
5	30 0	30 1	58 66	N	N	N	Fair,	Fair,
6	30 3	30 3	43 66	NE	W	W	Fair,	Fair,
7	30 45		46	Calm			Fair,	
8	30 6	30 6	53 68	N	N	N	Fair,	Fair,
9	30 5	30 4	53 70	NW	NW	NW	Fair,	Fair,
10	30 2	30 2	49 74	E	NW	NW	Fair,	Fair,
11	30 0	29 85	51 74	W	W	W	Fair,	Fair,
12	29 6	29 55	58 64	SW	NW	NW	Rain,	Rain,
13	29 85	29 9	49 69	NW	NW	NW	Fair,	Fair,
14	30 5	30 0	52 76	SW	SW	SW	Calm,	Fair,
15	29 75	29 8	56 54	SW	N	N	Fair,	Rain,
16	30 9	30 0	37 53	NNW	N	N	Fair,	Fair,
17	30 1	30 1	37 60	NE	NE	NE	Fair,	Fair,
18	30 1	30 1	41 62	NW	NW	NW	Fair,	Fair,
19	30 0	29 9	51 66	N	N	N	Cloudy,	Fair,
20	30 0	30 0	44 54	NW	N	N	Fair,	Fair,
21	30 0	30 2	49 59	N	NW	NW	Fair,	Fair,
22	29 6	29 5	51 65	NW	NW	NW	Fair,	Fair,
23	29 8	29 8	47 60	W	W	W	Fair,	Fair,
24	30 3	30 4	36 59	W	NW	NW	Fair,	Fair,
25	30 4	30 3	46 71	S	S	S	Cloudy,	Do. h. w.
26	30 2	30 2	60 72	Calm	SW	SW	Cloudy,	Cloudy,
27	30 3	30 3	44 44	NNE	NNE	NNE	Cloudy,	Cloudy,
28	30 2	30 1	34 37	N	N	N	Cloudy,	Cloudy,
29	29 85	29 85	28 44	NNW	NW	NW	Fair,	Fair,
30	30 1	30 1	28 49	Calm	SW	SW	Hazy,	Hazy,
31	30 15	30 2	42 45	Calm	NNE	NNE	Cloudy,	Rain.

NOVEMBER, 1793.

Days.	Barom.				Ther.		Winds.		Weather.	
	7 A. M.		2 P. M.		7 A. M.	2 P. M.	7 A. M.	2 P. M.	7 A. M.	2 P. M.
1	30	1	30	1	40	41	NNE	NE	Rain,	Cloudy,
2	30	3	30	25	32	49	NNE	NE	Fair,	Fair,
3	30	1	30	0	43	56	Calm	SW	Cloudy,	Cloudy,
4	29	8	29	9	55	67	SW	SW	Cloudy,	Fair,
5	30	15	30	1	50	64	NE	NE	Rain,	Rain,
6	29	8	29	65	63	67	S	S	Cloudy,	Cloudy,
7	29	8	29	8	44	64	Calm	SW	Fair,	Fair,
8	29	8	29	85	43	56	SSW	SW	Fair,	Fair,
9	29	9	29	95	42	64	SW	SW	Fair,	Fair,

OF THE METHOD OF CURE.

IN the introduction to the history of the fever, I mentioned the remedies which I used with success, in several cases which occurred in the beginning of August. I had seen, and recorded in my note book, the efficacy of gentle purges in the yellow fever of 1762; but finding them unsuccessful after the 20th of August, and observing the disease to assume uncommon symptoms of great prostration of strength, I laid them aside, and had recourse to a gentle vomit of ipecacuanha, on the first day of the fever, and to the usual remedies for exciting the action of the sanguiferous system. I gave bark in all its usual forms of infusion, powder, and tincture. I joined wine, brandy, and aromatics with it. I applied blisters to the limbs, neck, and head. Finding them all ineffectual, I attempted to rouse the system by wrapping the whole body, agreeably to Dr. Hume's practice in blankets dipped in warm vinegar. To these remedies I added one more: I rubbed the right side with mercurial ointment, with a view of exciting the action of the vessels in the whole system through the medium of the liver, which I then supposed to be principally, though symptomatically, affected by the disease. None of these remedies appeared to be of any service; for although three out of thirteen recovered, of those to whom they were applied, yet I have reason to believe that they would have recovered much sooner had the cure been trusted to nature. Perplexed and distressed by my want of success in the treatment of this fever, I waited upon Dr. Stevens, an eminent and worthy physician from St. Croix, who happened then to be in our city, and asked for such advice and information upon the subject of the disease, as his extensive practice in the West-Indies would naturally suggest. He politely informed me, that he had long ago laid aside evacuations of all kinds in the yellow fever; that they had been found to be hurtful, and that the disease yielded more readily to bark, wine, and, above all, to the use of the cold bath. He advised the bark to be given in large quantities by way of clyster, as well as in the usual way; and he in-

formed me of the manner in which the cold bath should be used, so as to derive the greatest benefit from it. This mode of treating the yellow fever, appeared to be reasonable. I had used bark, in the manner he recommended it, in several cases of sporadic yellow fever, with success, in former years. I had, moreover, the authority of several other physicians of reputation in its favour. Dr. Cleghorn tells us, that "he sometimes gave the bark when the bowels were full of vicious humours. These humours (he says) are produced by the fault of the circulation. The bark, by bracing the solids, enables them to throw off the excrementitious fluids, by the proper emunctories."*

I began the use of each of Dr. Stevens's remedies the next day after my interview with him, with great confidence of their success. I prescribed bark in large quantities: in one case I ordered it to be injected into the bowels every four hours. I directed buckets full of cold water to be thrown frequently upon my patients. The bark was offensive to the stomach, or rejected by it, in every case in which I prescribed it. The cold bath was grateful, and produced relief in several cases, by inducing a moisture on the skin. For a while I had hopes of benefit to my patients from the use of these remedies, but, in a few days, I was distressed to find they were not more effectual than those I had previously used. Three out of four of my patients died, to whom the cold bath was administered, in addition to the tonic remedies before mentioned.

Baffled in every attempt to stop the ravages of this fever, I anticipated all the numerous and complicated distresses in our city, which pestilential diseases have so often produced in other countries. The fever had a malignity and an obstinacy which I had never before observed in any disease, and it spread with a rapidity and mortality far beyond what it did in the year 1762. Heaven alone bore witness to the anguish of my soul in this awful situation. But I did not abandon a hope that the disease might yet be cured. I had long believed that good was commensurate with evil, and that there does not exist a disease for which the goodness of Providence has not provided a remedy. Under the impression of this belief I applied myself with fresh ardour to the investigation of the disease before me. I ransacked my library, and pored over every book that

treated of the yellow fever. The result of my researches for a while was fruitless. The accounts of the symptoms and cure of the disease by the authors I consulted were contradictory, and none of them appeared altogether applicable to the prevailing epidemic. Before I desisted from the inquiry to which I had devoted myself, I recollected that I had, among some old papers, a manuscript account of the yellow fever as it prevailed in Virginia in the year 1741, which had been put into my hands by Dr. Franklin, a short time before his death. I had read it formerly, and made extracts from it into my lectures upon that disease. I now read it a second time. I paused upon every sentence: even words in some places arrested and fixed my attention. In reading the history of the method of cure I was much struck with the following passages.

“It must be remarked, that this evacuation (meaning by purges) is more necessary in this than in most other fevers. The abdominal viscera are the parts principally affected in this disease, but by this timely evacuation their feculent corruptible contents are discharged, before they corrupt and produce any ill effects, and their various emunctories and secerning vessels are set open, so as to allow a free discharge of their contents, and consequently a security to the parts themselves, during the course of the disease. By this evacuation the very minera of the disease, proceeding from the putrid miasmata fermenting with the salivary, bilious, and other inquiline humours of the body, is sometimes eradicated by timely emptying the abdominal viscera, on which it first fixes, after which a gentle sweat does as it were nip it in its bud. Where the primæ viæ, but especially the stomach, is loaded with an offensive matter, or contracted and convulsed with the irritation of its stimulus, there is no procuring a laudable sweat till that is removed; after which a necessary quantity of sweat breaks *out of its own accord*, these parts promoting it when by an absterging medicine they are eased of the burden or stimulus which oppresses them.”

“All these acute putrid fevers ever require some evacuation to bring them to a perfect crisis and solution, and that even by stools, which must be promoted by art, where nature does not do the business herself. On this account an *ill-timed scrupulousness about the weakness of the body*

is of bad consequence in these urging circumstances; for it is that which seems chiefly to make evacuations necessary, which nature ever attempts, after the humours are fit to be expelled, but is not able to accomplish for the most part in this disease; and I can affirm that I have given a purge in this case, when *the pulse has been so low, that it could hardly be felt*, and the *debility extreme*, yet *both one and the other have been restored by it.*"

"This evacuation must be procured by *lenitive chologogue* purges."

Here I paused. A new train of ideas suddenly broke in upon my mind. I believed the weak and low pulse which I had observed in this fever, to be the effect of debility from a depressed state of the system, but the unsuccessful issue of purging, and even of a spontaneous diarrhoea, in a patient of Dr. Hutchinson, had led me not only to doubt of, but to dread its effects. My fears from this evacuation were confirmed, by the communication I had received from Dr. Stevens. I had been accustomed to raising a weak and low pulse in pneumony and apoplexy, by means of blood-letting, but I had attended less to the effects of purging in producing this change in the pulse. Dr. Mitchell in a moment dissipated my ignorance and fears upon this subject. I adopted his theory and practice, and resolved to follow them. It remained now only to fix upon a suitable purge to answer the purpose of discharging the contents of the bowels. I have before described the state of the bile in the gall-bladder and duodenum, in an extract from the history of a dissection made by Dr. Mitchell. I suspected that my want of success in discharging this bile, in several of the cases in which I attempted the cure by purging, was owing to the feebleness of my purges. I had been in the habit of occasionally purging with calomel in bilious and inflammatory fevers, and had recommended the practice the year before in my lectures, not only from my own experience, but upon the authority of Dr. Clark. I had, moreover, other precedents for its use in the practice of Sir John Pringle, Dr. Cleghorn, and Dr. Balfour, in diseases of the same class with the yellow fever. But these were not all my vouchers for the safety and efficacy of calomel. In my attendance upon the military hospitals during the late war, I had seen

it given combined with jalap in the bilious fever by Dr. Thomas Young, a senior surgeon in the hospitals. His usual dose was ten grains of each of them. This was given once or twice a day until it procured large evacuations from the bowels. For a while I remonstrated with the doctor against this purge, as being disproportioned to the violence and danger of the fever; but I was soon satisfied that it was as safe as cremor tartar or Glauber's salts. It was adopted by several of the surgeons of the hospital, and was universally known, and sometimes prescribed, by the simple name of *ten and ten*. This mode of giving calomel occurred to me in preference to any other. The jalap appeared to be a necessary addition to it, in order to quicken its passage through the bowels; for calomel is slow in its operation, more especially when it is given in large doses. I resolved, after mature deliberation, to prescribe this purge. Finding ten grains of jalap insufficient to carry the calomel through the bowels in the rapid manner I wished, I added fifteen grains of the former to ten of the latter; but even this dose was slow and uncertain in its operation. I then issued three doses, each consisting of fifteen grains of jalap and ten of calomel; one to be given every six hours until they procured four or five large evacuations. The effects of this powder not only answered, but far exceeded my expectations. It perfectly cured four out of the first five patients to whom I gave it, notwithstanding some of them were advanced several days in the disease. Mr. Richard Spain, a block-maker, in Third street, took eighty grains of calomel, and rather more of rhubarb and jalap mixed with it, on the two last days of August, and on the first day of September. He had passed twelve hours, before I began to give him this medicine, without a pulse, and with a cold sweat on all his limbs. His relations had given him over, and one of his neighbours complained to me of my neglecting to advise them to make immediate preparations for his funeral. But in this situation I did not despair of his recovery. Dr. Mitchell's account of the effects of purging in raising the pulse, excited a hope that he might be saved, provided his bowels could be opened. I now committed the exhibition of the purging medicine to Mr. Stall, one of my pupils, who mixed it, and gave it with his own hand, three or

four times a day. At length it operated, and produced two copious, fœtid stools. His pulse rose immediately afterwards, and an universal moisture on his skin succeeded the cold sweat on his limbs. In a few days he was out of danger, and soon afterwards appeared in the streets in good health, as the first fruits of the efficacy of mercurial purges in the yellow fever.

After such a pledge of the safety and success of my new medicine, I gave it with confidence. I communicated the prescription to such of the practitioners as I met in the streets. Some of them I found had been in the use of calomel for several days, but as they had given it in small and single doses only, and had followed it by large doses of bark, wine, and laudanum, they had done little or no good with it. I imparted the prescription to the college of physicians, on the third of September, and endeavoured to remove the fears of my fellow-citizens, by assuring them that the disease was no longer incurable. Mr. Lewis, the lawyer, Dr. M'Ilvaine, Mrs. Bethel, her two sons, and a servant maid, and Mr. Peter Baynton's whole family (nine in number,) were some of the first trophies of this new remedy. The credit it acquired, brought me an immense accession of business. It still continued to be almost uniformly effectual in all those which I was able to attend, either in person, or by my pupils. Dr. Griffitts, Dr. Say, Dr. Pennington, and my former pupils who had settled in the city, viz. Dr. Leib, Dr. Porter, Dr. Annan, Dr. Woodhouse, and Dr. Mease, were among the first physicians who adopted it. I can never forget the transport with which Dr. Pennington ran across Third street to inform me, a few days after he began to give strong purges, that the disease yielded to them in every case. But I did not rely upon purging alone to cure the disease. The theory of it which I had adopted led me to use other remedies to abstract excess of stimulus from the system. These were *blood-letting, cool air, cold drinks, low diet, and applications of cold water* to the body. I had bled Mrs. Bradford, Mrs. Leaming, and one of Mrs. Palmer's sons without success, early in the month of August. But I had witnessed the bad effects of bleeding in the first week in September, in two of my patients who had bled without my knowledge, and who appeared to have died in consequence of it. I had, more-

over, heard of a man who had been bled on the first day of the disease, who had died in twelve hours afterwards. These cases produced caution, but they did not deter me from bleeding as soon as I found the disease to change its type, and instead of tending to a crisis on the third, to protract itself to a later day. I began by drawing a small quantity at a time. The appearance of the blood, and its effects upon the system, satisfied me of its safety and efficacy. Never before did I experience such sublime joy as I now felt in contemplating the success of my remedies. It repaid me for all the toils and studies of my life. The conquest of this formidable disease was not the effect of accident, nor of the application of a single remedy; but it was the triumph of a principle in medicine. The reader will not wonder at this joyful state of my mind when I add a short extract from my note book, dated the 10th of September. "Thank God! out of one hundred patients, whom I have visited or prescribed for this day, I have lost none."

Being unable to comply with the numerous demands which were made upon me for the purging powders, notwithstanding I had requested my sister, and two other persons to assist my pupils in putting them up; and, finding myself unable to attend all the persons who sent for me, I furnished the apothecaries with the recipe for the mercurial purges, together with printed directions for giving them, and for the treatment of the disease.

Hitherto there had been great harmony among the physicians of the city, although there was a diversity of sentiment as to the nature and cure of the prevailing fever. But this diversity of sentiment and practice was daily lessening, and would probably have ceased altogether in a few days, had it not been prevented by two publications, the one by Dr. Kuhn, and the other by Dr. Stevens, in which they recommended bark, wine, and other cordials, and the cold bath, as the proper remedies for the disease. The latter dissuaded from the use of evacuations of all kinds. This method of cure was supported by a letter from Alexander Hamilton, Esq. then secretary of the treasury of the United States, to the college of physicians, in which he ascribed his recovery from the fever to the use of those remedies, administered by the hand of Dr. Stevens. The respectable

characters of those two physicians procured an immediate adoption of the mode of practice recommended by them, by most of the physicians of the city, and a general confidence in it by all classes of citizens. Had I consulted my interest, or regarded the certain consequences of opposing the use of remedies rendered suddenly popular by the names that were connected with them, I should silently have pursued my own plans of cure, with my old patients who still confided in them; but I felt, at this season of universal distress, my professional obligations to *all* the citizens of Philadelphia to be superior to private and personal considerations, and therefore determined at every hazard to do every thing in my power to save their lives. Under the influence of this disposition, I addressed a letter to the college of physicians, in which I stated my objections to Dr. Kuhn and Dr. Stevens's remedies, and defended those I had recommended. I likewise defended them in the public papers against the attacks that were made upon them by several of the physicians of the city, and occasionally addressed such advice to the citizens as experience had suggested to be useful to *prevent* the disease, particularly low diet, gentle doses of laxative physic, avoiding its exciting causes, and prompt applications for medical aid. In none of the recommendations of my remedies did I claim the credit of their discovery. On the contrary, I constantly endeavoured to enforce their adoption by mentioning precedents in favour of their efficacy, from the highest authorities in medicine. This controversy with my brethren, with whom I had long lived in friendly intercourse, carried on amidst the most distressing labours, was extremely painful to me, and was submitted to only to prevent the greater evil of the depopulation of our city by the use of remedies which had been prescribed by myself, as well as others, not only without effect, but with evident injury to the sick. The repeated and numerous instances of their inefficacy, in some of the most opulent families in the city, and the almost uniform success of the depleting remedies, happily restored the public mind, after a while, from its distracted state, and procured submission to the latter, from nearly all the persons who were affected by the fever.

Besides the two modes of practice which have been described, there were two others: the one consisted of *mode-*

rate purging with calomel only, and moderate bleeding, on the first or second day of the fever, and afterwards by the copious use of bark, wine, laudanum, and aromatic tonics. This practice was supported by an opinion, that the fever was inflammatory in its first, and putrid in its second stage. The other mode referred to was peculiar to the French physicians, several of whom had arrived in the city from the West-Indies, just before the disease made its appearance. Their remedies were various. Some of them prescribed nitre, cremor tartar, camphor, centaury tea, the warm bath, clysters, and moderate bleeding, while a few used lenient purges, and large quantities of tamarind water, and other diluted drinks. The dissensions of the American physicians threw a great number of patients into the hands of these French physicians. They were moreover supposed to be better acquainted with the disease than the physicians of the city, most of whom, it was well known, had never seen it before.

I shall hereafter inquire into the relative success of each of the four modes of practice which have been mentioned.

Having delivered a general account of the remedies which I used in this disease, I shall now proceed to make a few remarks upon each of them. I shall afterwards mention the effects of the remedies used by other physicians.

OF PURGING.

I HAVE already mentioned my reasons for promoting this evacuation, and the medicine I preferred for that purpose. It had many advantages over any other purge. It was detergent to the bile and mucus which lined the bowels. It probably acted in a peculiar manner upon the biliary ducts, and it was rapid in its operation. One dose was sometimes sufficient to open the bowels; but from two to six doses were often necessary for that purpose; more especially as part of them was frequently rejected by the stomach. I did not observe any inconvenience from the vomiting which was excited by the jalap. It was always

without that straining which was produced by emetics; and it served to discharge bile when it was lodged in the stomach. Nor did I rest the discharge of the contents of the bowels on the issue of one cleansing on the first day. There is, in all bilious fevers, a reproduction of morbid bile as fast as it is discharged. I therefore gave a purge every day while the fever continued. I used castor oil, salts, cremor tartar, and rhubarb (after the mercurial purges had performed their office,) according to the inclinations of my patients, in all those cases where the bowels were easily moved; but where this was not the case, I gave a single dose of calomel and jalap every day. Strong as this purge may be supposed to be, it was often ineffectual; more especially after the 20th of September, when the bowels became more obstinately constipated. To supply the place of the jalap, I now added gamboge to the calomel. Two grains and a half of each, made into a pill, were given to an adult every six hours, until they procured four or five stools. I had other designs in giving a purge every day, besides discharging the re-accumulated bile. I had observed the fever to fall with its principal force upon such parts of the body as had been previously weakened by any former disease. By creating an artificial weak part in the bowels, I diverted the force of the fever to them, and thereby saved the liver and brain from fatal or dangerous congestions. The practice was further justified by the beneficial effects of a plentiful and spontaneous diarrhœa, in the beginning of the disease;* by hæmorrhages from the bowels, when they occurred from no other parts of the body, and by the difficulty or impracticability of reducing the system by means of plentiful sweats. The purges seldom answered the intentions for which they were given, unless they produced four or five stools a day. As the fever showed no regard to day or night in the hours of its exacerbations, it became necessary to observe the same disregard to time in the exhibition of purges: I therefore pre-

* In some short manuscript notes upon Dr. Mitchell's account of the yellow fever in Virginia, in the year 1741, made by the late Dr. Kearsley, sen. of this city, he remarks, that in the yellow fever which prevailed in the same year in Philadelphia, "some recovered by an *early* discharge of black matter by stool." This gentleman, Dr. Redman informed me, introduced purging with Glauber's salts in the yellow fever in our city. He was preceptor to Dr. Redman in medicine.

scribed them in the evening, at all times when the patient had passed a day without two or three plentiful stools. When purges were rejected, or slow in their operation, I always directed opening clysters to be given every two hours. The effects of purging were as follow :

1. It raised the pulse when low, and reduced it when it was preternaturally tense or full.

2. It revived and strengthened the patient. This was evident in many cases, in the facility with which patients who had staggered to a close-stool, walked back again to their beds after a copious evacuation. Dr. Sydenham takes notice of a similar increase of strength after a plentiful sweat in the plague. They both acted by abstracting excess of stimulus, and thereby removing the depression of the system.

3. It abated the paroxysm of the fever. Hence arose the advantage of giving a purge in some cases in the evening, when an attack of the fever was expected in the course of the night.

4. It frequently produced sweats when given on the first or second day of the fever, after the most powerful sudorifics had been taken to no purpose.

5. It sometimes checked that vomiting which occurs in the beginning of the disease, and it always assisted in preventing the more alarming occurrence of that symptom about the 4th or 5th day.

6. It removed obstructions in the lymphatic system. I ascribe it wholly to the action of mercury, that in no instance did any of the glandular swelling, which I formerly mentioned, terminate in a suppuration.

7. By discharging the bile through the bowels as soon and as fast as it was secreted, it prevented, in most cases, a yellowness of the skin.

However salutary the mercurial purge was, objections were made to it by many of our physicians ; and prejudices, equally weak and ill-founded, were excited against it. I shall enumerate, and answer those objections.

1. It was said to be of too drastic a nature. It was compared to arsenic ; and it was called a dose for a horse. This objection was without foundation. Hundreds who took it declared they had never taken so mild a purge. I

met with but one case in which it produced bloody stools; but I saw the same effects from a dose of salts. It sometimes, it is true, operated from twenty to thirty times in the course of twenty-four hours; but I heard of an equal number of stools in two cases from salts and cremor tartar. It is not an easy thing to affect life, or even subsequent health, by copious or frequent purging. Dr. Kirkland mentions a remarkable case of a gentleman who was cured of rheumatism, by a purge, which gave him between 40 and 50 stools. This patient had been previously affected by his disease 16 or 18 weeks.* Dr. Moseley not only proves the safety, but establishes the efficacy of numerous and copious stools in the yellow fever. Dr. Say probably owes his life to three and twenty stools procured by a dose of calomel and gamboge, taken by my advice. Dr. Redman was purged until he fainted by a dose of the same medicine. This venerable gentleman, in whom 70 years had not abated the ardour of humanity, nor produced obstinacy of opinion, came forward from his retirement, and boldly adopted the remedies of purging and bleeding, with success in several families, before he was attacked by the disease. His recovery was as rapid, as the medicine he had used was active in its operation. Besides taking the above purge, he lost twenty ounces of blood by two bleedings.†

But who can suppose that a dozen or twenty stools in a day could endanger life, that has seen a diarrhœa continue for several months, attended with fifteen or twenty stools every day, without making even a material breach in the constitution? Hence Dr. Hillary has justly remarked, that

* Treatise on the Inflammatory Rheumatism, vol. i. p. 407.

† Dr. Redman was not the only instance furnished by the disease, in which *reason* got the better of the habits of old age, and of the formalities of medicine. About the time the fever declined, I received a letter from Dr. Shippen, sen (then above 82 years of age,) dated Oxford Furnace, New-Jersey, October 13th, 1793, in which, after approving in polite terms of my mode of practice, he adds, “ Desperate diseases require desperate remedies. I would only propose some small addition to your present method. Suppose you should substitute, in the room of the jalap, *six* grains of gamboge, to be mixed with ten or fifteen grains of calomel; and after a dose or two, as occasion may require, you should bleed your patients *almost* to death, at least to *fainting*; and then direct a plentiful supply of mallows tea, with fresh lemon juice, and sugar and barley water, together with the most simple, *mild* and nutritious food.” The doctor concludes his letter by recommending to my perusal Dr. Lover’s account of nearly a whole ship’s crew having been cured of a yellow fever, on the coast of South America, by being bled until they fainted.

"it rarely or never happens that the purging in this disease, though violent, takes the patient off, but the fever and inflammation of the bowels."* Dr. Clark in like manner remarks, that evacuations do not destroy life in the dysentery, but the fever, with the emaciation and mortification which attend and follow the disease.†

2. A second objection to this mercurial purge was, that it excited a salivation, and sometimes loosened the teeth. I met with but two cases in which there was a loss of teeth from the use of this medicine, and in both the teeth were previously loose or decayed. The salivation was a trifling evil, compared with the benefit which was derived from it. I lost only one patient in whom it occurred. I was taught, by this accidental effect of mercury, to administer it with other views than merely to cleanse the bowels, and with a success which added much to my confidence in the power of medicine over the disease. I shall mention those views under another head.

3. It was said that the mercurial purge excoriated the rectum, and produced the symptoms of pain and inflammation in that part, which were formerly mentioned.

To refute this charge, it will be sufficient to remark, that the bile produces the same excoriation and pain in the rectum in the bilious and yellow fever, where no mercury has been given to discharge it. In the bilious remitting fever which prevailed in Philadelphia, in 1780, we find the bile which was discharged by "gentle doses of salts, and cremor tartar, or the butternut pill, was so acrid as to excoriate the rectum, and so offensive as to occasion, in some cases, sickness and faintness both in the patients and in their attendants."‡

Dr. Hume says further upon this subject, that the rectum was so much excoriated by the natural discharge of bile in the yellow fever, as to render it impossible to introduce a clyster pipe into it.

4. It was objected to this purge, that it inflamed and lacerated the stomach and bowels. In support of this calumny, the inflamed and mortified appearances, which those viscera exhibited upon dissection in a patient who

* Diseases of Barbadoes, p. 212.

† Diseases in Voyages to Hot Climates, vol. ii. p. 322.

‡ Vol. i.

died at the hospital at Bush-hill, were spoken of with horror in some parts of the city. To refute this objection, it will only be necessary to review the account formerly given of the state of the stomach and bowels after death from the yellow fever, in cases in which no mercury had been given. I have before taken notice that sir John Pringle and Dr. Cleghorn had prescribed mercurial purges with success in the dysentery, a disease in which the bowels are affected with more irritation and inflammation than in the yellow fever. Dr. Clark informs us that he had adopted this practice. I shall insert the eulogium of this excellent physician upon the use of mercury in the dysentery, in his own words. "For several years past, when the dysentery has resisted the common mode of practice, I have administered mercury with the greatest success ; and am thoroughly persuaded that it is possessed of powers to *remove inflammation* and *ulceration* of the intestines, which are the chief causes of death in this distemper."*

5. It was urged against this powerful and efficacious medicine, that it was prescribed indiscriminately in all cases, and that it did harm in all weak habits. To this I answer, that there was no person so weak in constitution or a previous disease, as to be injured by a single dose of this medicine. Mrs. Meredith, the wife of the treasurer of the United States, a lady of uncommon delicacy of constitution, took two doses of the powder in the course of twelve hours, not only without any inconvenience, but with an evident increase of strength soon afterwards. Many similar cases might be mentioned. Even children took two or three large doses of it with perfect safety. This will not surprise those physicians who have been in the practice of giving from ten to twenty grains of mercury, with an equal quantity of jalap as a worm purge, and from fifty to a hundred grains of calomel, in the course of four or five days, in the internal dropsy of the brain. But I am happy in being able to add further, that many women took it in every stage of pregnancy without suffering the least inconvenience from it. Out of a great number of pregnant women whom I attended in this fever I did not lose one to whom I gave this medicine, nor did any of them suffer an abortion. One of them had twice miscarried in the course of the two or three last

* Vol. ii. p. 342.

years of her life. She bore a healthy child three months after her recovery from the yellow fever.

No one has ever objected to the *indiscriminate* mode of preparing the body for the small-pox by purging medicines. The *uniform* inflammatory diathesis of that disease justifies the practice, in a certain degree, in all habits. The yellow fever admits of a sameness of cure much more than the small-pox, for it is *more* uniformly and more highly inflammatory. An observation of Dr. Sydenham upon epidemics, applies, in its utmost extent, to our late fever. "Now it must be observed (says this most acute physician) that some epidemic diseases, in some years, are uniformly and constantly the same."* However diversified our fever was in some of its symptoms, it was in all cases accompanied by more or less inflammatory diathesis, and by a morbid state of the alimentary canal.

Much has been said of the bad effects of this purge from its having been put up carelessly by the apothecaries, or from its having been taken contrary to the printed directions by many people. If it did harm in any one case (which I do not believe) from the former of the above causes the fault is not mine. Twenty men employed constantly in putting up this medicine would not have been sufficient to have complied with all the demands which were made of me for it. Hundreds who were in health called or sent for it as well as the sick, in order to have it in readiness, in case they should be surprised by the disease in the night, or at a distance in the night, or at a distance from a physician.

In all the cases in which this purge was supposed to have been hurtful, when given on the first or second day of the disease, I believe it was because it was not followed by repeated doses of the same, or of some other purge, or because it was not aided by blood-letting. I am led to make this assertion, not only from the authority of Dr. Sydenham, who often mentions the good effects of bleeding in moderating or checking a diarrhoea, but by having heard no complaints of patients being purged to death by this medicine, after blood-letting was universally adopted by all the physicians in the city.

It was remarked, that the demand for this purging powder continued to increase under all opposition, and that the

sale of it by the apothecaries was greatest towards the close of the disease. I shall hereafter say that this was not the case with the West-India remedies.

It is possible that this purge sometimes proved hurtful when it was given on the fifth day of the disease, but it was seldom given for the *first* time after the third day, and when it was, the patient was generally in such a situation that nothing did him either good or harm.

I derived great pleasure from hearing, after the fever had left the city, that calomel had been given with success as a purge in bilious fevers in other parts of the Union besides Philadelphia. Dr. Lawrence informed me that he had cured many patients by it of the yellow fever which prevailed in New-York, in the year 1791, and the New-York papers have told us that several practitioners had been in the habit of giving it in the autumnal fevers, with great success, in the western parts of that state. They had probably learned the use of it from Dr. Young, who formerly practised in that part of the United States, and who lost no opportunity of making its praise public wherever he went.

I have only to add to my account of that purging medicine, that, under an expectation that the yellow fever would mingle some of its bilious symptoms with the common inflammatory fevers of the winter and first spring months, I gave that purge in the form of pills, in every case of inflammatory fever to which I was called. The fatal issue of several fevers in the city, during the winter, in which this precaution had been neglected, convinced me that my practice was proper and useful.

It is to be lamented that all new remedies are forced to pass through a fiery ordeal. Opium and bark were long the objects of terror and invective in the schools of medicine. They were administered only by physicians for many years, and that too with all the solemnity of a religious ceremony. This error, with respect to those medicines, has at last passed away. It will, I hope, soon be succeeded by a time when the prejudices against *ten* and *ten* or *ten* and *fifteen*, will sleep with the vulgar fears which were formerly entertained of the bark producing diseases and death, years after it had been taken, by "lying in the bones."

OF BLOOD-LETTING.

THE theory of this fever which led me to administer purges, determined me to use blood-letting, as soon as it should be indicated. I am disposed to believe that I was tardy in the use of this remedy, and I shall long regret the loss of three patients, who might probably have been saved by it. I cannot blame myself for not having used it earlier, for the immense number of patients which poured in upon me, in the first week of September, prevented my attending so much to each of them as was necessary to determine upon the propriety of this evacuation. I was in the situation of a surgeon in a battle, who runs to every call, and only stays long enough with each soldier to stop the bleeding of his wound, while the increase of the wounded, and the unexpected length of the battle, leave his original patients to suffer from the want of more suitable dressings. The reasons which determined me to bleed were,

1. The state of the pulse, which became more tense, in proportion as the weather became cool.

2. The appearance of a moist and *white* tongue, on the first day of the disease, a certain sign of an inflammatory fever.

3. The frequency of hæmorrhages from every part of the body, and the perfect relief given in some cases by them.

4. The symptoms of congestion in the brain, resembling those which occur in the first stage of hydrocephalus internus, a disease in which I had lately used bleeding with success.

5. The character of the diseases which had preceded the yellow fever. They were all more or less inflammatory. Even the scarlatina anginosa had partaken so much of that diathesis, as to require bleeding to subdue it.

6. The warm and dry weather which had likewise preceded the fever. Dr. Sydenham attributes a highly inflammatory state of the small-pox to a previously hot and dry summer; and I have since observed, that Dr. Hillary takes

notice of inflammatory fevers having frequently succeeded hot and dry weather in Barbadoes.* He informs us further, that the yellow fever is always most acute and inflammatory after a very hot season.†

7. The authority of Dr. Mosely had great weight with me in advising the loss of blood, more especially as his ideas of the highly inflammatory nature of the fever accorded so perfectly with my own.

8. I was induced to prescribe blood-letting by recollecting its good effects in Mrs. Palmer's son, whom I bled on the 20th of August, and who appeared to have been recovered by it.

Having begun to bleed, I was encouraged to continue it by the appearance of the blood, and by the obvious and very great relief my patients derived from it.

The following is a short account of the appearances of the blood drawn from a vein in this disease.

1. It was, in the greatest number of cases, without any separation into crassamentum and serum, and of a scarlet colour.

2. There was in many cases a separation of the blood into crassamentum and *yellow* serum.

3. There were a few cases in which this separation took place and the serum was of a *natural* colour.

4. There were many cases in which the blood was as sizzly as in pneumony and rheumatism.

5. The blood was in some instances covered above with blue pellicle of sizzly lymph, while the part which lay in the bottom of the bowl was dissolved. The lymph was in two cases mixed with green streaks.

6. It was in a few instances of a dark colour, and as fluid as molasses. I saw this kind of blood in a man who walked about his house during the whole of his sickness, and who finally recovered. Both this, and the fifth kind of blood which has been mentioned, occur chiefly where bleeding had been omitted altogether, or used too sparingly in the beginning of the disease.

7. In some patients the blood, in the course of the disease, exhibited nearly *all* the appearances which have been mentioned. They were varied by the time in which the

* Diseases of Barbadoes, p. 16, 43, 46, 48, 52, 122.

† Page 174.

blood was drawn, and by the nature and force of the remedies which have been used in the disease.

The effects of blood-letting upon the system were as follow :

1. It raised the pulse when depressed, and quickened it, when it was preternaturally slow, or subject to intermissions.

2. It reduced its force and frequency.

3. It checked in many cases the vomiting which occurred in the beginning of the disease, and thereby enabled the stomach to retain the purging medicine. It likewise assisted the purge in preventing the dangerous or fatal vomiting which came on about the fifth day.

4. It lessened the difficulty of opening the bowels. Upon this account, in one of my addresses to the citizens of Philadelphia, I advised bleeding to be used *before*, as well as after taking the mercurial purge. Dr. Woodhouse informed me that he had several times seen patients call for the close-stool while the blood was flowing from the vein.

5. It removed delirium, coma, and obstinate wakefulness. It also prevented or checked hæmorrhages ; hence perhaps another reason why not a single instance of abortion occurred in such of my female patients as were pregnant.

6. It disposed, in some cases, to a gentle perspiration.

7. It lessened the muscular debility of the system ; hence patients frequently rose from their beds, and walked across their rooms, in a few hours after the operation had been performed.

8. The redness of the eyes frequently disappeared in a few hours after bleeding. Mr. Coxe observed a dilated pupil to contract to its natural size within a few minutes after he had bound up the arm of his patient. I remarked, in the former part of this work, that blindness in many instances attended or followed this fever. But two such cases occurred among my patients. In one of them it was of short continuance, and in the other it was probably occasioned by the want of sufficient bleeding. In every case of blindness that came to my knowledge bleeding had been omitted, or used only in a very moderate degree.

9. It eased *pain*. Thousands can testify this effect of blood-letting. Many of my patients whom I bled with

my own hand acknowledged to me, while the blood was flowing, that they were better; and some of them declared, that all their pains had left them before I had completely bound up their arms.

10. But blood-letting had, in many cases, an effect the opposite of *easing* pain. It frequently increased it in every part of the body, more especially in the head. It appeared to be the effect of the system rising suddenly from a state of great depression, and of an increased action of the blood-vessels which took place in consequence of it. I had frequently seen complaints of the breast, and of the head, made worse by a single bleeding, and from the same cause. It was, in some cases an unfortunate event in the yellow fever, for it prevented the blood-letting being repeated, by exciting or strengthening the prejudices of patients and physicians against it. In some instances the patients grew worse after a second, and, in one, after a third bleeding. This was the case in Miss Redman. Her pains increased after three bleedings, but yielded to the fourth. Her father, Dr. Redman, concurred in this seemingly absurd practice. It was at this time my old preceptor in medicine reminded me of Dr. Sydenham's remark, that moderate bleeding did harm in the plague where copious bleeding was indicated, and that in the cure of that disease, we should leave nature wholly to herself, or take the cure altogether out of her hands. The truth of this remark was very obvious. By taking away as much blood as restored the blood-vessels to a morbid degree of action, without reducing this action afterwards, pain, congestion, and inflammation were frequently increased, all of which were prevented, or occurred in a less degree, when the system rose gradually from the state of depression which had been induced by the great force of the disease. Under the influence of the facts and reasonings which have been mentioned I bore the same testimony in acute cases, against what was called *moderate* bleeding that I did against bark, wine, and laudanum in this fever.

11. Blood-letting, when used *early* on the first day, frequently strangled the disease in its birth, and generally rendered it more light, and the convalescence more speedy and perfect. I am not sure that it ever shortened the duration of the fever where it was not used within a few

hours of the time of its attack. Under every mode of treatment it seemed disposed, after it was completely formed, to run its course. I was so satisfied of this peculiarity in the fever, that I ventured in some cases to predict the day on which it would terminate, notwithstanding I took the cure entirely out of the hands of nature. I did not lose a patient on the third, whom I bled on the first or second day of the disease.

12. In those cases which ended fatally, blood-letting restored, or preserved the use of reason, rendered death easy, and retarded the putrefaction of the body after death.

I shall now mention some of the circumstances which directed and regulated the use of this remedy.

1. Where bleeding had been omitted for three days, in acute cases, it was seldom useful. Where purging had been used, it was sometimes successful. I recovered two patients who had taken the mercurial purges, whom I bled for the first time on the seventh day. One of them was the daughter of Mr. James Cresson, the other was a journeyman ship-carpenter at Kensington. In those cases where bleeding had been used on the first day, it was both safe and useful to repeat it every day afterwards, during the continuance of the fever.

2. I preferred bleeding in the exacerbation of the fever. The remedy here was applied when the disease was in its greatest force. A single paroxysm was like a sudden squall to the system, and, unless abated by bleeding or purging, often produced universal disorganization. I preferred the former to the latter remedy in cases of great danger, because it was more speedy, and more certain in its operation.

3. I bled in several instances in the remission of the fever, where the pulse was tense and corded. It lessened the violence of the succeeding paroxysm.

4. I bled in all those cases in which the pulse was preternaturally slow, provided it was tense. Mr. Benj. W. Morris, Mr. Thomas Warton, jun. and Mr. Wm. Sansom, all owe their lives probably to their having been bled in the above state of the pulse. I was led to use bleeding in this state of the pulse, not only by the theory of the disease which I had adopted, but by the success which had often attended this remedy, in a slow and depressed state

of the pulse in apoplexy and pneumony. I had moreover the authority of Dr. Mosely in its favour, in the yellow fever, and of Dr. Sydenham, in his account of a new fever, which appeared in the year 1685. The words of the latter physician are so apposite to the cases which have been mentioned, that I hope I shall be excused for inserting them in this place. "All the symptoms of weakness (says our author) proceed from nature's being in a manner oppressed and overcome by the first attack of the disease, so as not to be able to raise regular symptoms adequate to the violence of the fever. I remember to have met with a remarkable instance of this several years ago, in a young man I then attended; for though he seemed in a manner expiring, yet the outward parts felt so cool, that I could not persuade the attendants he had a fever, which could not disengage, and show itself clearly, because the vessels were so full as to obstruct the motion of the blood. However, I said, that they would soon find the fever rise high enough upon bleeding him. Accordingly, after taking away a large quantity of blood, as violent a fever appeared as ever I met with, and did not go off till bleeding had been used three or four times."*

5. I bled in those cases in which the fever appeared in a tertian form, provided the pulse was full and tense. I well recollect the surprise with which Mr. Van Berkel heard this prescription from me, at a time when he was able to walk and ride out on the intermediate days of a tertian fever. The event which followed this prescription showed that it was not disproportioned to the violence of his disease, for it soon put on such acute and inflammatory symptoms as to require six subsequent bleedings to subdue it.

6. I bled in those cases where patients were able to walk about, provided the pulse was the same as has been mentioned under the fourth head. I was determined as to the propriety of bleeding in these two supposed mild forms of the fever, by having observed each of them, when left to themselves, frequently to terminate in death.

7. I paid no regard to the dissolved state of the blood, when it appeared on the first or second day of the disease, but repeated the bleedings afterwards in every case, where

* Vol. ii. p. 351.

the pulse continued to indicate it. It was common to see sizzly blood succeed that which was dissolved. This occurred in Mr. Josiah Coates, and Mr. Samuel Powel. Had I believed that this dissolved state of the blood arose from its putrefaction, I should have laid aside my lancet as soon as I saw it; but I had long ago parted with all ideas of putrefaction in bilious fevers. The refutation of this doctrine was the object of one of my papers in the Medical Society of Edinburgh, in the year 1767. The dissolved appearance of the blood, I suppose to be the effect of a certain action of the blood-vessels upon it. It occurs in fevers which depend upon the sensible qualities of the air, and in which no putrid or foreign matter has been introduced into the system.

8. The presence of petechiæ did not deter me from repeating blood-letting, where the pulse retained its fulness or tension. I prescribed it with success in the cases of Dr. Mease, and of Mrs. Gebler, in Dock-street, in each of whom petechiæ had appeared. Bleeding was equally effectual in the case of the Rev. Mr. Keating, at a time when his arms were spotted with that species of eruptions which I have compared to moscheto-bites. I had precedents in Dr. De Haen* and Dr. Sydenham,† in favour of this practice. So far from viewing these eruptions as signs of putrefaction, I considered them as marks of the highest possible inflammatory diathesis. They disappeared in each of the above cases after bleeding.

9. In determining the quantity of blood to be drawn, I was governed by the state of the pulse, and by the temperature of the weather. In the beginning of September, I found one or two moderate bleedings sufficient to subdue the fever; but in proportion as the system rose by the diminution of the stimulus of heat, and the fever put on more *visible* signs of inflammatory diathesis, more frequent bleedings became necessary. I bled many patients twice, and a few three times a day. I preferred frequent and small, to large bleedings, in the beginning of September; but towards the height and close of the epidemic, I saw no inconvenience from the loss of a pint, and even twenty ounces of blood at a time. I drew from many persons

* Ratio Medendi, vol. ii. p. 162. vol. iv. p. 172.

† Vol. i. p. 210, and 264.

seventy and eighty ounces in five days; and from a few, a much larger quantity. Mr. Gribble, cedar-cooper, in Front-street, lost by ten bleedings a hundred ounces of blood; Mr. George, a carter in Ninth-street, lost about the same quantity by five bleedings: and Mr. Peter Mierken, one hundred and fourteen ounces in five days. In the last of the above persons the quantity taken was determined by weight. Mr. Toy, blacksmith near Dock-street, was eight times bled in the course of seven days. The quantity taken from him was about a hundred ounces. The blood in all these cases was dense, and in the last very sizzly. They were all attended in the month of October, and chiefly by my pupil, Mr. Fisher; and they were all, years afterwards, living and healthy instances of the efficacy of copious blood-letting, and of the intrepidity and judgment of their young physician. Children, and even old people, bore the loss of much more blood in this fever than in common inflammatory fevers. I took above thirty ounces in five bleedings, from a daughter of Mr. Robert Bridges, who was then in the 9th year of her age. Even great debility, whether natural or brought on by previous diseases, did not, in those few cases in which it yielded to the fever, deprive it of the uniformity of its inflammatory character. The following letter from Dr. Griffiths, written soon after his recovery from a third attack of the fever, and just before he went into the country for the re-establishment of his health, will furnish a striking illustration of the truth of the above observation.

“I cannot leave town without a parting adieu to my kind friend, and sincere prayers for his preservation.

“I am sorry to find that the use of the lancet is still so much dreaded by too many of our physicians; and, while lamenting the death of a valuable friend this morning, I was told that he was bled but *once* during his disease. Now if my poor frame, reduced by previous sickness, great anxiety, and fatigue, and a very low diet, could bear *seven* bleedings, in five days, besides purging, and no diet but toast and water, what shall we say of physicians who bleed but once?

“*October 19th, 1793.*”

I have compared a paroxysm of this fever to a sudden squall; but the disease in its whole course was like a

tedious equinoctial gale acting upon a ship at sea ; its destructive force was only to be opposed by handing every sail, and leaving the system to float, as it were under bare poles. So great was the fragility (if I may be allowed the expression) of the blood-vessels, that it was necessary to unload them of their contents, in order to prevent the system sinking from hæmorrhages, or from effusions in the viscera, particularly the brain.

9. Such was the indomitable nature of the pulse, in some patients, that it did not lose its force after numerous and copious bleedings. In all such cases I considered the diminution of its frequency, and the absence of a vomiting, as signals to lay aside the lancet. The continuance of this preternatural force in the pulse appeared to be owing to the miasmata, which were universally diffused in the air, acting upon the arterial system in the same manner that it did in persons who were in apparent good health.

Thus have I mentioned the principal circumstances which were connected with blood-letting in the cure of the yellow fever. I shall now consider the objections that were made to it at the time, and since the prevalence of the fever.

It was said that the bleeding was unnecessarily copious ; and that many had been destroyed by it. To this I answer, that I did not lose a single patient whom I bled seven times or more in this fever. As a further proof that I did not draw an ounce of blood too much it will only be necessary to add, that hæmorrhages frequently occurred after a third, a fourth, and in one instance (in the only son of Mr. William Hall) after a sixth bleeding had been used ; and further, that not a single death occurred from natural hæmorrhages in the first stage of the disease. A woman who had been bled by my advice, awoke the night following in a bath of her blood, which had flowed from the orifice in her arm. The next day she was free from pain and fever. There were many recoveries in the city from similar accidents. There were likewise some recoveries from copious natural hæmorrhages in the more advanced stages of the disease, particularly when they occurred from the stomach and bowels. I left a servant maid of Mrs. Morris's in Walnut-street, who had discharged at least four pounds of blood from her stomach, without a pulse, and with scarcely a symptom that encouraged a hope of her

life; but the next day I had the pleasure of finding her out of danger.

It was remarked that fainting was much less common after bleeding in this fever than in common inflammatory fevers. This circumstance was observed by Dr. Griffiths, as well as myself. It has since been confirmed to me by three of the principal bleeders in the city, who performed the operation upwards of four thousand times. It occurred chiefly in those cases where it was used for the first time on the third or fourth day of the disease. A swelling of the legs, moreover, so common after a plentiful bleeding in pneumony and rheumatism, rarely succeeded the use of this remedy in the yellow fever.

2. Many of the indispositions, and much of the subsequent weakness of persons who had been cured by copious blood-letting, have been ascribed to it. This is so far from being true, that the reverse of it has occurred in many cases. Mr. Mierken worked in his sugar-house in good health, nine days after his last bleeding; and Mr. Gribble and Mr. George seemed to have derived fresh vigour from their evacuations. I could mention the names of many people who assured me their constitutions had been improved by the use of those remedies; and I know several persons in whom they have carried off habitual complaints. Mr. Richard Wells attributed his relief from a chronic rheumatism to the copious bleeding and purging which were used to cure him of the yellow fever; and Mr. William Young, the bookseller, was relieved of a chronic pain in his side, by means of the same remedies.

3. It was said, that blood-letting was prescribed indiscriminately in all cases, without any regard to age, constitution, or the force of the disease. This is not true, as far as it relates to my practice. In my prescriptions for patients whom I was unable to visit, I advised them, when they were incapable of judging of the state of the pulse, to be guided in the use of bleeding, by the degrees of pain they felt, particularly in the head; and I seldom advised it for the *first* time, after the second or third day of the disease.

In pneumonies which affect whole neighbourhoods in the spring of the year, bleeding is the universal remedy. Why should it not be equally so, in a fever which is of a more uniform inflammatory nature, and which tends more

rapidly to effusions, in parts of the body much more vital than the lungs?

I have before remarked, that the debility which occurs in the beginning of the yellow fever, arises from a depressed state of the system. The debility in the plague is of the same nature. It has long been known that debility from the sudden abstraction of stimuli is to be removed by the *gradual* application of stimuli, but it has been less observed, that the excess of stimulus in the system is best removed in a *gradual* manner, and that too in proportion to the degrees of depression, which exist in the system.

This principle in the animal economy has been acknowledged by the practice of occasionally stopping the discharge of water from a canula in tapping, and of blood from a vein, in order to prevent fainting.

Child-birth induces fainting, and sometimes death, only by the *sudden* abstraction of the stimulus of distention and pain.

In all those cases where purging or bleeding have produced death in the yellow fever or plague, when they have been used on the first or second day of those diseases, I suspect that it was occasioned by the quantity of the stimulus abstracted being disproportioned to the degrees of depression in the system. The following facts will I hope throw light upon this subject.

1. Dr. Hodges informs us, that “although blood could not be drawn in the plague, even in the smallest quantity without danger, yet a *hundred* times the quantity of fluids was discharged in pus from buboes without inconvenience.”*

2. Pareus, after condemning bleeding in the plague, immediately adds an account of a patient, who was saved by an hæmorrhage from the nose, which continued *two* days.†

3. I have before taken notice that bleeding proved fatal in three cases in the yellow fever, in the month of August; but at that time I saw one, and heard of another case, in which death seemed to have been prevented by a bleeding at the nose. Perhaps the uniform good effects which were observed to follow a spontaneous hæmorrhage from an orifice in the arm, arose wholly from the *gradual* manner

* Page 114.

† Skenkious, lib. vi. p. 881.

in which the stimulus of the blood was in this way abstracted from the body. Dr. Williams relates a case of the recovery of a gentleman from the yellow fever, by means of small hæmorrhages, which continued three days, from wounds in his shoulders made by being cupped. He likewise mentions several other recoveries by hæmorrhages from the nose, after "a vomiting of black humours and a hiccup had taken place."*

4. There is a disease in North-Carolina, known among the common people by the name of the "pleurisy in the head." It occurs in the winter, after a sickly autumn, and seems to be an evanescent symptom of a bilious remitting fever. The cure of it has been attempted by bleeding, in the common way, but generally without success. It has, however, yielded to this remedy in another form, that is, to the discharge of a few ounces of blood obtained by thrusting a piece of quill up the nose.

5. Riverius describes a pestilential fever which prevailed at Montpellier, in the year 1623, which carried off one half of all who were affected by it.† After many unsuccessful attempts to cure it, this judicious physician prescribed the loss of *two* or *three* ounces of blood. The pulse rose with this small evacuation. Three or four hours afterwards he drew six ounces of blood from his patients, and with the same good effect. The next day he gave a purge, which, he says, rescued his patients from the grave. All whom he treated in this manner recovered. The whole history of this epidemic is highly interesting, from its agreeing with our late epidemic in so many of its symptoms, more especially as they appeared in the different states of the pulse.

An old and intelligent citizen of Philadelphia, who remembers the yellow fever of 1741, says that when it first made its appearance, bleeding was attended with fatal consequences. It was laid aside afterwards, and the disease prevailed with great mortality until it was checked by the cold weather. Had blood been drawn in the manner mentioned by Riverius, or had it been drawn in the usual way, after the abstraction of the stimulus of heat by the cool weather, the disease might probably have been subdued,

* Essay on the Bilious or Yellow Fever of Jamaica, p. 40.

† De Febre Pestilenti, vol. ii. p. 145, 146, and 147.

and the remedy of blood-letting thereby have recovered its character.

Dr. Hodges has another remark, in his account of the plague in London in the year 1665, which is still more to our purpose than the one which I have quoted from it upon this subject. He says that "bleeding, as a preventive of the plague, was only safe and useful when the blood was drawn by a *small* orifice, and a *small* quantity taken at *different* times."*

I have remarked, in the history of this fever, that it was often cured on the first or second day by a copious sweat. The Rev. Mr. Ustick was one among many whom I could mention, who were saved from a violent attack of the fever by this evacuation. It would be absurd to suppose that the miasmata which produced the disease were discharged in this manner from the body. The sweat seemed to cure the fever only by lessening the quantity of the fluids, and thus *gradually* removing the depression of the system. The profuse sweats which sometimes cure the plague, as well as the disease, which is brought on by the bite of poisonous snakes, seem to act in the same way.

The system, in certain states of malignant fever, resembles a man struggling beneath a load of two hundred weight, who is able to lift but one hundred and seventy-five. In order to assist him it will be to no purpose to attempt to infuse additional vigour into his muscles by the use of a whip or of strong drink. Every exertion will serve only to waste his strength. In this situation (supposing it impossible to divide the weight which confines him to the ground) let the pockets of this man be emptied of their contents, and let him be stripped of so much of his clothing as to reduce his weight five and twenty or thirty pounds. In this situation he will rise from the ground; but if the weights be abstracted suddenly, while he is in an act of exertion, he will rise with a spring that will endanger a second fall, and probably produce a temporary convulsion in his system. By abstracting the weights from his body more gradually, he will rise by degrees from the ground, and the system will accommodate itself in such a manner to the diminution of its pressure, as to resume

its erect form, without the least deviation from the natural order of its appearance and motions.

It has been said that the stimulating remedies of bark, wine, and the cold bath, were proper in our late epidemic in August, and in the beginning of September, but that they were improper afterwards. If my theory be just, they were more improper in August and the beginning of September, than they were after the disease put on the outward and common signs of inflammatory diathesis. The reason why a few strong purges cured the disease at its first appearance, was, because they abstracted in a *gradual* manner some of the immense portion of stimulus under which the arterial system laboured, and thus gradually relieved it from its low and weakening degrees of depression.

Bleeding was fatal in these cases, probably because it removed this depression in too sudden a manner.

The principle of the gradual abstraction, as well as of the gradual application of stimuli to the body, opens a wide field for the improvement of medicine. Perhaps all the discoveries of future ages will consist more in a new application of established principles, and in new modes of exhibiting old medicines, than in the discovery of new theories, or of new articles of the *materia medica*.

The reasons which induced me to prescribe purging and bleeding, in so liberal a manner, naturally led me to recommend *cool* and *fresh air* to my patients. The good effects of it were obvious in almost every case in which it was applied. It was equally proper whether the arterial system was depressed, or whether it discovered, in the pulse, a high degree of morbid excitement. Dr. Griffiths furnished a remarkable instance of the influence of cool air upon the fever. Upon my visiting him, on the morning of the 8th of October, I found his pulse so full and tense as to indicate bleeding, but after sitting a few minutes by his bedside, I perceived that the windows of his room had been shut in the night by his nurse, on account of the coldness of the night air. I desired that they might be opened. In ten minutes afterwards the doctor's pulse became so much slower and weaker that I advised the postponement of the bleeding, and recommended a purge instead of it. The bleeding notwithstanding became necessary, and was used with great advantage in the afternoon of the same day.

The cool air was improper only in those cases where a chilliness attended the disease.

For the same reason that I advised cool air, I directed my patients to use cold *drinks*. They consisted of lemonade, tamarind, jelly and raw apple water, toast and water, and of weak balm, and camomile tea. The subacid drinks were preferred in most cases, as being not only most agreeable to the taste, but because they tended to compose the stomach. All these drinks were taken in the early stage of the disease. Towards the close of it, I permitted the use of porter and water, weak punch, and when the stomach would bear it, weak wine-whey.

I forbade all cordial and stimulating food in the active state of the arterial system. The less my patients ate, of even the mildest vegetable food, the sooner they recovered. Weak coffee, which (as I have formerly remarked) was almost universally agreeable, and weak tea were always inoffensive. As the action of the pulse diminished, I indulged my patients with weak chocolate; also with milk, to which roasted apples or minced peaches, and (where they were not to be had) bread or Indian mush were added.

Towards the crisis, I advised the drinking of weak chicken, veal, or mutton broth, and after the crisis had taken place, I permitted mild animal food to be eaten in a small quantity, and to be increased according to the waste of the excitability of the system. This strict abstinence which I imposed upon my patients did not escape obloquy; but the benefits they derived from it, and the ill effects which arose in many cases from a contrary regimen, satisfied me that it was proper in every case in which it was prescribed.

Cold water was a most agreeable and powerful remedy in this disease. I directed it to be applied by means of napkins to the head, and to be injected into the bowels by way of clyster. It gave the same ease to both, when in pain, which opium gives to pain from other causes. I likewise advised the washing of the face and hands, and sometimes the feet, with cold water, and always with advantage. It was by suffering the body to lie for some time in a bed of cold water, that the inhabitants of the island of Massuah cured the most violent bilious fevers.* When applied

* Bruce's Travels.

in this way, it *gradually* abstracts the heat from the body, and thereby lessens the action of the system. It differs as much in its effects upon the body from the cold bath, as rest in a cold room differs from exercise in the cold and open air.

I was first led to the practice of the partial application of cold water to the body, in fevers of too much force in the arterial system, by observing its good effects in active hæmorrhages, and by recollecting the effects of a partial application of warm water to the feet, in fevers of an opposite character. Cold water when applied to the feet as certainly reduces the pulse in force and frequency, as warm water, applied in the same way, produces contrary effects upon it. In an experiment which was made at my request, by one of my pupils, by placing his feet in cold pump water for a few minutes, the pulse was reduced 24 strokes in a minute, and became so small as hardly to be perceptible.

But this effect of cold water, in reducing the frequency of the pulse, is not uniform. In weak and irritable habits, it increases its frequency. This has been fully proved by a number of experiments, made by my former pupil, Dr. Stock, of Bristol, in England, and published in his "Medical Collections of the Effects of Cold, as a Remedy in certain Diseases."*

In the use of the remedies which were necessary to overcome the inflammatory action of the system, I was obliged to reduce it below its natural point of excitement. In the present imperfect state of our knowledge in medicine, perhaps no disease of too much action can be cured without it.

Besides the remedies which have been mentioned, I was led to employ another of great efficacy. I had observed a favourable issue of the fever, in every case in which a spontaneous discharge took place from the salivary glands. I had observed further, that all such of my patients (one excepted) as were salivated by the mercurial purges recovered in a few days. This early suggested an idea to me that the calomel might be applied to other purposes than the discharging of bile from the bowels. I ascribed its salutary effects, when it salivated in the first stage of the

disease, to the excitement of inflammation and effusion in the throat, diverting them from more vital parts of the body. In the second stage of the disease, I was led to prescribe it as a stimulant, and, with a view of obtaining this operation from it, I aimed at exciting a salivation, as speedily as possible, in all cases. Two precedents encouraged me to make trial of this remedy.

In the month of October, 1789, I attended a gentleman in a bilious fever, which ended in many of the symptoms of a typhus mitior. In the lowest state of his fever, he complained of a pain in his right side, for which I ordered half an ounce of mercurial ointment to be rubbed on the part affected. The next day, he complained of a sore mouth, and, in the course of four and twenty hours, he was in a moderate salivation. From this time his pulse became full and slow, and his skin moist; his sleep and appetite suddenly returned, and in a day or two he was out of danger. The second precedent for salivation in a fever, which occurred to me, was in Dr. Haller's short account of the works of Dr. Cramer.* The practice was moreover justified, in point of safety, as well as the probability of success, by the accounts which Dr. Clark has lately given of the effects of a salivation in the dysentery.† I began by prescribing the calomel in small doses, at short intervals, and afterwards I directed large quantities of the ointment to be rubbed upon the limbs. The effects of it, in every case in which it affected the mouth, were salutary. Dr. Woodhouse improved upon my method of exciting the salivation, by rubbing the gums with calomel, in the manner directed by Mr. Clare. It was more speedily in its operation in this way than in any other, and equally effectual. Several persons appeared to be benefitted by the mercury introduced into the system in the form of an ointment, where it did *not* produce a salivation. Among these, were the Rev. Dr. Blackwell, and Mr. John Davis.

Soon after the above account was written of the good effects of a mercurial salivation in this fever, I had great satisfaction in discovering that it had been prescribed with equal, and even greater success, by Dr. Wade in Bengal, in the year 1791, and by Dr. Chisholm in the island of

* Bibliotheca Medicinæ Practicæ, vol. iii. p. 491.

† Diseases of Long Voyages to Hot Climates, vol. ii. p. 334

Granada, in the cure of bilious yellow fevers.* Dr. Wade did not lose one, and Dr. Chisholm lost only one out of forty-eight patients in whom the mercury affected the salivary glands. The latter gave 150 grains of calomel, and applied the strongest mercurial ointment below the groin of each side, in some cases. He adds further, that not a single instance of a relapse occurred, where the disease was cured by salivation.

After the reduction of the system, *blisters* were applied with great advantage to every part of the body. They did most service when they were applied to the crown of the head. I did not see a single case, in which a mortification followed the sore, which was created by a blister.

Brandy and water, or porter and water, when agreeable to the stomach, with now and then a cup of chicken broth, were the drinks I prescribed to assist in restoring the tone of the system.

In some cases I directed the limbs to be wrapped in flannels dipped in warm spirits, and cataplasms of bruised garlic to be applied to the feet. But my principal dependence, next to the use of mercurial medicines, for exciting a healthy action in the arterial system, was upon mild and gently stimulating food. This consisted of rich broths, the flesh of poultry, oysters, thick gruel, mush and milk, and chocolate. I directed my patients to eat or drink a portion of some of the above articles of diet every hour or two during the day, and in cases of great debility, from an exhausted state of the system, I advised their being waked for the same purpose two or three times in the night. The appetite frequently craved more savoury articles of food, such as beef-steaks and sausages; but they were permitted with great caution, and never till the system had been prepared for them by a less stimulating diet.

There were several *symptoms* which were very distressing in this disease, and which required a specific treatment.

For the vomiting, with a burning sensation in the stomach, which came on about the fifth day, I found no remedy equal to a table spoonful of sweet milk, taken every hour, or to small draughts of milk and water. I was led to prescribe this simple medicine from having heard, from

* Medical Commentaries, vol. xviii. p. 209, 288.

a West-India practitioner, and afterwards read, in Dr. Hume's account of the yellow fever, encomiums upon the milk of the cocoa-nut for this troublesome symptom. Where sweet milk failed of giving relief, I prescribed small doses of sweet oil, and in some cases a mixture of equal parts of milk, sweet oil, and molasses. They were all intended to dilute or blunt the acrimony of the humours, which were either effused or generated in the stomach. Where they all failed of checking the vomiting, I prescribed weak camomile tea, or porter, or cider and water, with advantage. In some of my patients the stomach rejected all the mixtures and liquors which have been mentioned. In such cases I directed the stomach to be left to itself for a few hours, after which it sometimes received and retained the drinks that it had before rejected, provided they were administered in a small quantity at a time.

The vomiting was sometimes stopped by a blister applied to the external region of the stomach.

A mixture of liquid laudanum and sweet oil, applied to the same place, gave relief where the stomach was affected by pain only, without a vomiting.

I have formerly mentioned that a distressing *pain* often seized the lower part of the *bowels*. I was early taught that laudanum was not a proper remedy for it. It yielded in almost every case to two or three emollient clysters, or to the loss of a few ounces of blood.

The convalescence from this fever was in general rapid, but in some cases it was very slow. I was more than usually struck by the great resemblance which the system in the convalescence from this fever bore to the state of the body and mind in old age. It appeared, 1. In the great weakness of the body, more especially of the limbs. 2. In uncommon depression of mind, and in a great aptitude to shed tears. 3. In the absence or short continuance of sleep. 4. In the frequent occurrence of appetite, and, in some cases, in its inordinate degrees. And 5. In the loss of the hair of the head, or in its being suddenly changed in some cases to a gray colour.

Pure air, gentle exercise, and agreeable society removed the debility both of body and mind of this premature and temporary old age. I met with a few cases, in which the yellow colour continued for several weeks after the patient's

recovery from all the other symptoms of the fever. It was removed most speedily and effectually by two or three moderate doses of calomel and rheubarb.

A feeble and irregular intermittent was very troublesome in some people, after an acute attack of the fever. It yielded gradually to camomile or snake-root tea and country air.

In a publication, dated the 16th of September, I recommended a diet of milk and vegetables, and cooling purges to be taken once or twice a week, to the citizens of Philadelphia. This advice was the result of the theory of the disease I had adopted, and of the successful practice which had arisen from it. In my intercourse with my fellow-citizens, I advised this regimen to be regulated by the degrees of fatigue and foul air to which they were exposed. I likewise advised moderate blood-letting to all such persons as were of a plethoric habit. To men whose minds were influenced by the publications in favour of bark and wine, and who were unable at that time to grasp the extent and force of the remote cause of this terrible fever, the idea of dieting, purging, or bleeding the inhabitants of a whole village or city appeared to be extravagant and absurd: but I had not only the analogy of the regimen made use of to prepare the body for the small-pox, but many precedents in favour of the advice. Dr. Haller has given extracts from the histories of two plagues, in which the action of the miasmata was prevented or mitigated by bleeding.* Dr. Hodges confirms the utility of the same practice. The benefits of low diet, as a preventive of the plague, were established by many authors, long before they received the testimony of the benevolent Mr. Howard in their favour. Socrates in Athens, and Justinian in Constantinople, were preserved, by means of their abstemious modes of living, from the plagues which occasionally ravaged those cities. By means of the low diet, gentle physic, and occasional bleedings, which I thus publicly recommended, the disease was prevented in many instances, or rendered mild where it was taken. But my efforts to prevent the disease in my fellow-citizens did not end here. I advised them, not only in the public-papers, but in my intercourse with them, to avoid heat, cold, labour, and

* *Bibliotheca Medicinæ Practicæ*, vol. ii. p. 93, and 387.

every thing else that could excite the miasmata (which I knew to be present in all their bodies) into action. I forgot, upon this occasion, the usual laws which regulate the intercourse of man with man. In the streets, and, upon the public roads in my excursions into the neighbourhood of the city, I cautioned many persons, whom I saw walking or riding in an unsafe manner, of the danger to which they exposed themselves ; and thereby, I hope, prevented an attack of the disease in many people.

It was from a conviction of the utility of low diet, gentle evacuations, and of carefully shunning all the exciting causes which I have mentioned, that I concealed, in no instance, from my patients the name of their disease. This plainness, which was blamed by weak people, produced strict obedience to my directions, and thereby restrained the progress of the fever in many families, or rendered it, when taken, as mild as inoculation does the small-pox. The opposite conduct of several physicians, by preventing the above precautions, increased the mortality of the disease, and, in some instances, contributed to the extinction of whole families.

I proceed now to make a few remarks upon the remedies recommended by Doctors Kuhn and Stevens, and by the French physicians. The former were bark, wine, laudanum, spices, the elixir of vitriol, and the cold bath.

In every case in which I prescribed bark, it was offensive to the stomach. In several tertians which attended the convalescence from a common attack of the fever, I found it always unsuccessful, and once hurtful. Mr. Wil-ling took it for several weeks without effect. About half a pint of a weak decoction of the bark produced, in Mr. Samuel Meredith, a paroxysm of the fever, so violent as to require the loss of ten ounces of blood to moderate it. Dr. Annan informed me that he was forced to bleed one of his patients twice, after having given him a small quantity of bark, to hasten his convalescence.

It was not in this epidemic only that the bark was hurtful. Baron Humboldt informed me that Dr. Comoto had assured him, it hastened death in every case in which it was given in the yellow fever of Vera Cruz. If, in any instance, it was inoffensive, or did service, in our fever, I suspect it must have acted upon the bowels as a purge.

Dr. Sydenham says the bark cured intermittents by this evacuation;* and Mr. Bruce says it operated in the same way, when it cured the bilious fevers at Massuah.

Wine was nearly as disagreeable as the bark to the stomach, and equally hurtful. I tried it in every form, and of every quality. But without success. It was either rejected by the stomach, or produced in it a burning sensation. I should suspect that I had been mistaken in my complaints against wine, had I not since met with an account in Shenkius of its having destroyed all who took it in the famous Hungarian fever which prevailed, with great mortality, over nearly every country in Europe, about the middle of the 16th century.† Dr. Wade declares wine to be “ill adapted to the fevers of Bengal, where the treatment has been proper in other respects.”

Laudanum has been called by Dr. Mosely “a fatal medicine” in the yellow fever. In one of my patients, who took only fifteen drops of it, without my advice, to ease a pain in his bowels, it produced a delirium, and death in a few hours. I was much gratified in discovering that my practice, with respect to the use of opium in this fever, accorded with Dr. Wade’s in the fever of Bengal. He tells us, “that it was mischievous in almost every instance, even in combination with antimonials.”

The *spices* were hurtful in the first stage of the fever, and, when sufficient evacuations had been used, they were seldom necessary in its second.

The *elixir of vitriol* was, in general, offensive to the stomach.

The *cold bath* was useful in those cases where its sedative prevailed over its stimulating effects. But this could not often happen, from the suddenness and force, with which the water was thrown upon the body. In two cases in which I prescribed it, it produced a gentle sweat, but it did not save life. In a third it removed a delirium, and reduced the pulse for a few minutes, in frequency and force, but this patient died. The recommendation of it indiscriminately, in all cases, was extremely improper. In that chilliness and tendency to fainting upon the least

* Vol. i. p. 440.

† Omnes qui vini potione non abstinuerunt, interiere, adeo ut summa spes salvationis in vini abstinentia collocata videtur. Lib. vi. p. 847.

motion, which attended the disease in some patients, it was an unsafe remedy. I heard of a woman who was seized with delirium immediately after using it, from which she never recovered; and of a man who died a few minutes after he came out of a bathing tub. Had this remedy been the exclusive antidote to the yellow fever, the mortality of the disease would have been but little checked by it. Thousands must have perished from the want of means to procure tubs, and of a suitable number of attendants to apply the water, and to lift the patient in and out of bed. The reason of our citizens ran before the learning of the friends of this remedy, and long before it was abandoned by the physicians, it was rejected as useless, or not attempted, because impracticable, by the good sense of the city. It is to be lamented that the remedy of cold water has suffered in its character by the manner in which it was advised. In fevers of too much action, it reduces the morbid excitement of the blood-vessels, provided it be *applied without force*, and for a considerable time, to the body. It is in the jail fever, and in the second stage of the yellow fever, only, in which its stimulant and tonic powers are proper. Dr. Jackson establishes this mode of using it, by informing us, that when it did service, it “gave vigour and tone” to the system.*

A mode of practice which I formerly mentioned in this fever, consisted of a union of the evacuating and tonic remedies. The physicians who adopted this mode gave calomel by itself, in small doses, on the first or second day of the fever, bled once or twice, in a sparing manner, and gave the bark, wine, and laudanum, in large quantities, upon the first appearance of a remission. After they began the use of these remedies purging was omitted, or, if the bowels were moved, it was only by means of gentle clysters. This practice, I shall say hereafter, was not much more successful than that which was recommended by Dr. Kuhn and Dr. Stevens. It resembled throwing water and oil at the same time upon a fire, in order to extinguish it.

The *French* remedies were nitre and cremor tartar, in small doses, centuary tea, camphor, and several other warm medicines; subacid drinks, taken in large quantities, the warm bath, and moderate bleeding.

* Fevers of Jamaica.

After what has been said it must be obvious to the reader, that the nitre and cremor tartar, in small doses, could do no good, and that camphor, and all cordial medicines must have done harm. The diluting subacid drinks, which the French physicians gave in large quantities were useful in diluting and blunting the acrimony of the bile, and to this remedy, assisted by occasional bleeding, I ascribe most of the cures which were performed by those physicians.

Those few persons in whom the *warm bath* produced copious and universal sweats recovered, but, in nearly all the cases which came under my notice, it did harm.

I come now to inquire into the comparative success of all the different modes of practice which have been mentioned.

I have already said that ten out of thirteen patients whom I treated with bark, wine, and laudanum, and that three out of four, in whom I added the cold bath to those remedies, died. Dr. Pennington informed me, that he had lost all the patients (six in number) to whom he had given the above medicines. Dr. Johnson assured me, with great concern, about two weeks before he died, that he had not recovered a single patient by them. Whole families were swept off where these medicines were used. But further, most of those persons who received the seeds of the fever in the city, and sickened in the country, or in the neighbouring towns, and who were treated with tonic remedies died. There was not a single cure performed by them in New-York, where they were used in several sporadic cases with every possible advantage. But why do I multiply proofs of their deadly effects? The clamours of hundreds whose relations had perished by them, and the fears of others, compelled those physicians who were most attached to them to lay them aside, or to prepare the way for them (as it was called) by purging and bleeding. The bathing tub soon shared a worse fate than bark, wine, and laudanum, and, long before the disease disappeared, it was discarded by all the physicians in the city.

In answer to these facts we are told, that Mr. Hamilton and his family were cured by Dr. Stevens' remedies, and that Dr. Kuhn had administered them with success in several instances.

Upon these cures I shall insert the following judicious remarks from Dr. Sydenham. "Success (says the doctor)

is not a sufficient proof of the excellency of a method of cure in acute diseases, since some are recovered by the imprudent procedure of old women; but it is further required, that the distemper should be *easily cured*, and yield conformably to its *own* nature.”* And again, speaking of the cure of the new fever of 1685, this incomparable physician observes, “If it be objected that this fever frequently yields to a quite contrary method to that which I have laid down, I answer, that the cure of a disease by a method which is attended with success only *now* and *then*, in a *few* instances, differs extremely from that practical method, the efficacy whereof appears both from its recovering *greater numbers*, and all the practical phenomena happening in the cure.”†

Far be it from me to deny that the depression of the system may not be overcome by such stimuli as are more powerful than those which occasion it. This has sometimes been demonstrated by the efficacy of bark, wine, and laudanum, in the confluent and petechial small-pox; but even this state of that disease yields more easily to blood-letting, or to plentiful evacuations from the stomach and bowels, on the first or second day of the eruptive fever. This I have often proved, by giving a large dose of tartar emetic and calomel, as soon as I was satisfied from circumstances, that my patient was infected with the small-pox. But the depression produced by the yellow fever appears to be much greater than that which occurs in the small-pox, and hence it more uniformly resisted the most powerful tonic remedies.

In one of my publications during the prevalence of the fever I asserted, that the remedies of which I have given a history cured a greater proportion than ninety-nine out of a hundred, of all who applied to me on the first day of the disease, before the 15th day of September. I regret that it is not in my power to furnish a list of them, for a majority of them were poor people, whose names are still unknown to me. I was not singular in this successful practice in the first appearance of the disease. Dr. Pennington assured me on his death bed, that he had not lost one, out of forty-eight patients whom he had treated agreeably to the principles and practice I had recommended.

* Vol. ii. p. 254.

† Vol. ii. p. 354.

Dr. Griffitts triumphed over the disease in every part of the city, by the use of what were called the new remedies. My former pupils spread, by their success, the reputation of purging and bleeding, wherever they were called. Unhappily the pleasure we derived from this success in the treatment of the disease, was of short duration. Many circumstances contributed to lessen it, and to revive the mortality of the fever. I shall briefly enumerate them.

1. The distraction produced in the public mind, by the recommendation of remedies, the opposites in every respect of purging and bleeding.

2. The opinion which had been published by several physicians, and inculcated by others, that we had other fevers in the city besides the yellow fever. This produced a delay in many people in sending for a physician, or in taking medicines, for two or three days, from a belief that they had nothing but a cold, or a common fever. Some people were so much deceived by this opinion, that they refused to send for physicians, lest they should be infected by them with the yellow fever. In most of the cases in which these delays took place, the disease proved mortal.

To obviate a suspicion that I have laid more stress upon the fatal influence of this error than is just, I shall here insert an extract of a letter I received from Mr. John Connelly, one of the city committee, who frequently left his brethren in the city hall, and spent many hours in visiting and prescribing for the sick. "The publications (says he) of some physicians, that there were but few persons infected with the yellow fever, and that many were ill with colds and common remitting and fall fevers, proved fatal to almost every family which was credulous enough to believe them. That opinion slew its hundreds if not its thousands, many of whom did not send for a physician until they were in the last stage of the disorder, and beyond the power of medicine."

3. The interference of the friends of the stimulating system, in dissuading patients from submitting to sufficient evacuations.

4. The deceptions which were practised by some patients upon their physicians, in their reports of the quantity of blood they had lost, or of the quality and number of their evacuations by stool.

5. The impracticability of procuring bleeders as soon as

bleeding was prescribed. Life in this disease, as in the apoplexy, frequently turned upon that operation being performed within an *hour*. It was often delayed, from the want of a bleeder, one or two days.

6. The inability of physicians, from the number of their patients, and from frequent indisposition, to visit the sick, at such times as was necessary to watch the changes in their disease.

7. The great accumulation and concentration of the miasmata in sick rooms, from the continuance of the disease in the city, whereby the system was exposed to a constant stimulus, and the effect of the evacuations was thus defeated.

8. The want of skill or fidelity in nurses to administer the medicines properly ; to persuade patients to drink frequently ; also to supply them with food or cordial drinks when required in the night.

9. The great degrees of debility induced in the systems of many of the people who were affected by the disease, from fatigue in attending their relations or friends.

10. The universal depression of mind, amounting in some instances to despair, which affected many people. What medicine could act upon a patient who awoke in the night, and saw through the broken and faint light of a candle, no human creature, but a black nurse, perhaps asleep in a distant corner of the room ; and who heard no noise, but that of a hearse conveying, perhaps, a neighbour or a friend to the grave ? The state of mind under which many were affected by the disease, is so well described by the Rev. Dr. Smith, in the case of his wife, in a letter I received from him in my sick room, two days after her death, that I hope I shall be excused for inserting an extract from it. It forms a part of the history of the disease. The letter was written in answer to a short note of condolence which I sent to the doctor immediately after hearing of Mrs. Smith's death. After some pathetic expressions of grief, he adds, " The scene of her funeral, and some preceding circumstances, can never depart from my mind. On her return from a visit to our daughter, whom we had been striving to console on the death of Mrs. Kepple, who was long familiar and dear to both, my dear wife, passing the burying-ground gate, led me into the ground, viewed the graves of her two

children, called the old grave-digger, marked a spot for herself as close as possible to them and the grave of Dr. Phineas Bond, whose memory she adored. Then, by the side of the spot she had chosen, we found room and chose *mine*, pledging ourselves to each other, and directing the grave-digger, that this should be the order of our interment. We returned to our house. Night approached. I hoped my dear wife had gone to rest, as she had chosen, since her return from nursing her daughter, to sleep in a chamber by herself, through fear of infecting her grandchild and me. But it seems she closed not her eyes; sitting with them fixed through her chamber window on Mrs. Keppele's house, till about midnight she saw her hearse, and followed it with her eyes as far as it could be seen. Two days afterwards Mrs. Rodgers, her next only surviving intimate friend, was carried past her window, and by no persuasion could I draw her from thence, nor stop her sympathetic foreboding tears, so long as her eyes could follow the funeral, which was through two squares, from Fourth to Second street, where the hearse disappeared." The doctor proceeds in describing the distress of his wife. But pointed as his expressions are, they do not convey the gloomy state of her mind with so much force as she has done it herself in two letters to her niece, Mrs. Cadwallader, who was then in the country. The one was dated the 9th, the other the 11th of October. I shall insert a few extracts from each of them.

October 9th. "It is not possible for me to pass the streets without walking in a line with the dead, passing infected houses, and looking into open graves. This has been the case for many weeks." "I don't know what to write; my head is gone, and my heart is torn to pieces." "I entreat you to have no fears on my account. I am in the hands of a just and merciful God, and his will be done."

October 11th. "Don't wonder that I am so low to-day. My heart is sunk down within me."

The next day this excellent woman sickened, and died on the 19th of the same month.

If in a person possessed naturally of uncommon equanimity and fortitude, the distresses of our city produced such dejection of spirits, what must have been their effect upon

hundreds, who were not endowed with those rare and extraordinary qualities of mind! Death, in this, as well as in many other cases in which medicine had done its duty, appeared to be the inevitable consequence of the total abstraction of the energy of the mind in restoring the natural motions of life.

Under all the circumstances which have been mentioned, which opposed the system of depletion in the cure of this fever, it was still far more successful than any other mode of cure that had been pursued before in the United States, or in the West-Indies.

Three out of four died of the disease in Jamaica, under the care of Dr. Hume.

Dr. Blane considers it as one of the "most mortal" of diseases, and Dr. Jackson places a more successful mode of treating it among the subjects which will admit of "innovation" in medicine.

After the 15th of September, my success was much limited, compared with what it had been before that time. But at no period of the disease did I lose more than one in twenty of those whom I saw on the first day, and attended regularly through every stage of the fever, provided they had not been previously worn down by attending the sick.

The following statement, which will admit of being corrected, if it be inaccurate, will, I hope, establish the truth of the above assertions.

About one half of the families whom I have attended for many years, left the city. Of those who remained, many were affected by the disease. Out of the whole of them, after I had adopted my second mode of practice, I lost but five heads of families, and about a dozen servants and children. In no instance did I lose both heads of the same family. My success in these cases was owing to two causes: 1st, To the credit my former patients gave to my public declaration, that we had only *one* fever in the city: hence they applied on the *first* day, and sometimes on the *first* hour of their indisposition; and 2dly, To the numerous pledges many of them had seen of the safety and efficacy of copious blood-letting, by my advice, in other diseases: hence my prescription of that necessary remedy was always obeyed in its utmost extent. Of the few adults whom I

lost, among my former patients, two of them were old people, two took laudanum, without my knowledge, and one refused to take medicine of any kind; all the rest had been worn down by previous fatigue.

I have before said that a great number of the blacks were my patients. Of these not one died under my care. This uniform success, among those people, was not owing altogether to the mildness of the disease, for I shall say presently, that a great proportion of a given number died, under other modes of practice.

In speaking of the comparative effects of purging and bleeding, it may not be amiss to repeat, that not one pregnant woman, to whom I prescribed them, died or suffered abortion. Where the tonic remedies were used, abortion or death, and, in many instances, both, were nearly universal.

Many whole families, consisting of five, six, and, in three instances, of nine members, were recovered by plentiful purging and bleeding. I could swell this work, by publishing a list of those families; but I take more pleasure in adding, that I was not singular in my success in the use of the above remedies. They were prescribed with great advantage by many of the physicians of the city, who had for a while given tonic medicines without effect. I shall not mention the names of any of the physicians who *totally* renounced those medicines, lest I should give offence by not mentioning them all. Many large families were cured by some of them, after they adopted and prescribed copious purging and blood-letting. One of them cured ten in the family of Mr. Robert Haydock, by means of those remedies. In one of that family, the disease came on with a vomiting of black bile.

But the use of the new remedies was not directed finally by the physicians alone. The clergy, the apothecaries, many private citizens, several intelligent women, and two black men, prescribed them with great success. Nay more, many persons prescribed them to themselves, and, as I shall say hereafter, with a success that was unequalled by any of the regular or irregular practitioners in the city.

It was owing to the almost universal use of purging and bleeding, that the mortality of the disease diminished, in proportion as the number of persons who were affected by

it increased. About the middle of October, it was scarcely double of what it was in the middle of September, and yet six times the number of persons were probably at that time confined by it.

The success of copious purging and bleeding was not confined to the city of Philadelphia. Several persons, who were infected in town, and sickened in the country, were cured by them.

Could a comparison be made of the number of patients who died of the yellow fever in 1793, after having been plentifully bled and purged, with those who died of the same disease in the years 1699, 1741, 1747, and 1762, I am persuaded that the proportion would be very small in the year 1793, compared with the former years.* Including all who died under every mode of treatment, I suspect the mortality to be less, in proportion to the population of the city, and the number of persons who were affected than it was in any of the other years that have been mentioned.

Not less than 6000 of the inhabitants of Philadelphia probably owe their lives to purging and bleeding, during the autumn.

I proceed with reluctance to inquire into the comparative success of the French practice. It would not be difficult to decide upon it from many facts that came under my notice in the city; but I shall rest its merit wholly upon the returns of the number of deaths at Bush-hill. This hospital, after the 22d of September, was put under the care of a French physician, who was assisted by one of the physicians of the city. The hospital was in a pleasant and airy situation; it was provided with all the necessaries and comforts for sick people that humanity could invent, or liberally supply. The attendants were devoted to their duty; and cleanliness and order pervaded every room in the house. The reputation of this hospital, and of the French physician, drew patients to it in the early state of the disease. Of this I have been assured in a letter from Dr. Annan, who was appointed to examine and give orders of admission into the hospital, to such of the poor of the dis-

* It appears from one of Mr. Norris's letters, dated the 9th of November, O. S. that there died 220 persons, in the year 1699, with the yellow fever. Between 80 and 90 of them, he says, belonged to the society of Friends. The city, at this time, probably, did not contain more than 2 or 3000 people, many of whom, it is probable, fled from the disease.

trict of Southwark, as could be taken care of in their own houses. Mr. Olden has likewise informed me, that most of the patients who were sent to the hospital by the city committee (of which he was a member) were in the first stage of the fever. With all these advantages, the deaths between the 22d of September and the 6th of November, amounted to 448 out of 807 patients who were admitted into the hospital within that time. Three fourths of all the blacks (nearly 20) who were patients in this hospital died. A list of the medicines prescribed there may be seen in the minutes of the proceedings of the city committee. Calomel and jalap are not among them. *Moderate* bleeding, and purging with Glauber's salts, I have been informed, were used in some cases by the physicians of this hospital. The proportion of deaths to the recoveries, as it appears in the minutes of the committee from whence the above report is taken, is truly melancholy! I hasten from it therefore to a part of this work, to which I have looked with pleasure, ever since I sat down to compose it.

I have said that the clergy, the apothecaries, and many other persons who were uninstructed in the principles of medicine, prescribed purging and bleeding with great success in this disease. Necessity gave rise to this undisciplined sect of practitioners, for they came forward to supply the places of the regular bred physicians who were sick or dead. I shall mention the names of a few of those persons who distinguished themselves as volunteers in this new work of humanity. The late Rev. Mr. Fleming, one of the ministers of the Catholic church, carried the purging powders in his pocket, and gave them to his poor parishioners with great success. He even became the advocate of the new remedies. In a conversation I had with him, on the 22d of September, he informed me, that he had advised four of our physicians, whom he met a day or two before, "to renounce the pride of science, and to adopt the new mode of practice, for that he had witnessed its good effects in many cases." Mr. John Keihmle, a German apothecary, has assured me, that out of 314 patients whom he visited, and 187 for whom he prescribed, from the reports of their friends, he lost but 47 (which is nearly but one in eleven,) and that he treated them all agreeably to

the method which I had recommended. The Rev. Mr. Schmidt, one of the ministers of the Lutheran church, was cured by him. I have before mentioned an instance of the judgment of Mr. Connelly, and of his zeal in visiting and prescribing for the sick. His remedies were bleeding and purging. He, moreover, bore a constant and useful testimony against bark, wine, laudanum, and the warm bath.* Mrs. Paxton, in Carter's alley, and Mrs. Evans, the wife of Mr. John Evans, in Second street, were indefatigable; the one in distributing mercurial purges composed by herself, and the other in urging the necessity of *copious* bleeding and purging among her friends and neighbours, as the only safe remedies for the fever. These worthy women were the means of saving many lives.† Absalom Jones and Richard Allen, two black men, spent all the intervals of time, in which they were not employed in burying the dead, in visiting the poor who were sick, and in bleeding and purging them, agreeably to the directions which had been printed in all the newspapers. Their success was unparalleled by what is called regular practice. This encomium upon the practice of the blacks will not surprise the reader, when I add that they had no fear of putrefaction in the fluids, nor of the calumnies of a body of their fellow-citizens in the republic of medicine, to deter them from plentiful purging and bleeding. They had, besides, no more patients than they were able to visit two or three times a day. But great as their success was, it was exceeded by those persons, who, in despair of procuring medical aid of any kind, purged and bled themselves. This palm of superior success

* In the letter before quoted, from Mr. Connelly, he expresses his opinion of those four medicines in the following words: "Laudanum, bark, and wine have put a period to the existence of some where the fever has been apparently broken, and the patients in a fair way of recovery; a single dose of laudanum has hurried them suddenly into eternity. I have visited a few patients where the hot bath was used, and am convinced that it only tended to weaken and relax the system, without producing any good effect."

† The yellow fever prevailed at the Caraccas, in South America, in October, 1793, with great mortality, more especially among the Spanish troops. Nearly all died who were attended by physicians. Recourse was finally had to the old women, who were successful in almost every case to which they were called. Their remedies were a liquor called *narencado* (a species of lemonade) and a tea made of a root called *fistula*. With these drinks they drenched their patients for the first two or three days. They induced plentiful sweats, and, probably, after blunting, discharged the bile from the bowels. I received this information from an American gentleman, who had been cured, by one of those Amazons in medicine, in the above way.

will not be withheld from those people, when I explain the causes of it. It was owing to their *early* use of the proper remedies, and to their being guided in the repetition of them, by the continuance of a tense pulse, or of pain and fever. A day, an afternoon, and even an hour, were not lost by these people in waiting for the visit of a physician, who was often detained from them by sickness, or by new and unexpected engagements, by which means the precious moment for using the remedies with effect passed irrevocably away. I have stated these facts from faithful inquiries, and numerous observations. I could mention the names and families of many persons who thus cured themselves. One person only shall be mentioned, who has shown by her conduct what reason is capable of doing when it is forced to act for itself. Mrs. Long, a widow, after having been twice unsuccessful in her attempts to procure a physician, undertook at last to cure herself. She took several of the mercurial purges, agreeably to the printed directions, and had herself *bled* seven times in the course of five or six days. The indication for repeating the bleeding was the continuance of the pain in her head. Her recovery was rapid and complete. The history of it was communicated to me by herself, with great gratitude, in my own house, during my second confinement with the fever. To these accounts of persons who cured themselves in the city, I could add many others, of citizens who sickened in the country, and who cured themselves by plentiful bleeding and purging, without the attendance of a physician.

From a short review of these facts, reason and humanity awake from their long repose in medicine, and unite in proclaiming, that it is time to take the cure of pestilential epidemics out of the hands of physicians, and to place it in the hands of the people. Let not the reader startle at this proposition. I shall give the following reasons for it.

1. In consequence of these diseases affecting a number of people at one time, it has always been, and always will be impossible, for them *all* to have the benefit of medical aid, more especially as the proportion of physicians to the number of sick, is generally diminished upon these occasions, by desertion, sickness, and death.

2. The safety of committing to the people the cure of pestilential fevers, particularly the yellow fever and the

plague, is established by the simplicity and uniformity of their causes, and of their remedies. However diversified they may be in their symptoms, the system, in both diseases, is generally under a state of undue excitement or great depression, and in most cases requires the abstraction of stimulus in a greater or less degree, or in a sudden or gradual manner. There can never be any danger of the people injuring themselves by mistaking any other disease for an *epidemic* yellow fever or plague, for no other febrile disease can prevail with them. It was probably to prevent this mistake, that the Benevolent Father of mankind, who has permitted no evil to exist which does not carry its antidote along with it, originally imposed that law upon all great and mortal epidemics.

3. The history of the yellow fever in the West-Indies proves the advantage of trusting patients to their own judgment. Dr. Lind has remarked, that a greater proportion of Sailors who had no physicians recovered from that fever, than of those who had the best medical assistance. The fresh air of the deck of a ship, a purge of salt water, and the free use of cold water, probably triumphed here over the cordial juleps of physicians.

4. By committing the cure of this and other pestilential epidemics to the people, all those circumstances which prevented the universal success of purging and bleeding, in this disease, will have no operation. The fever will be mild in most cases, for all will prepare themselves to receive it, by a vegetable diet, and by moderate evacuations. The remedies will be used the *moment* the disease is felt, or even seen, and its violence and danger will thereby be obviated. There will then be no disputes among physicians, about the nature of the disease, to distract the public mind, for they will seldom be consulted in it. None will suffer from chronic debility induced by previous fatigue in attending the sick, nor from the want of nurses, for few will be so ill as to require them, and there will be no "foreboding" fears of death, or despair of recovery, to invite an attack of the disease, or to ensure its mortality.

The small-pox was once as fatal as the yellow fever and the plague. It has since yielded as universally to a vegetable diet and evacuations, in the hands of apothecaries,

the clergy, and even of the good women, as it did in the hands of doctors of physic.

They have narrow conceptions, not only of the Divine Goodness, but of the gradual progress of human knowledge, who suppose that all pestilential diseases shall not, like the small-pox, sooner or later cease to be the scourge and terror of mankind.

For a long while, air, water, and even the light of the sun, were dealt out by physicians to their patients with a sparing hand. They possessed, for several centuries, the same monopoly of many artificial remedies. But a new order of things is rising in medicine. Air, water, and light are taken without the advice of a physician, and bark and laudanum are now prescribed every where by nurses and mistresses of families, with safety and advantage. Human reason cannot be stationary upon these subjects. The time must and will come, when, in addition to the above remedies, the general use of calomel, jalap, and the lancet, shall be considered among the most essential articles of the knowledge and rights of man.

It is no more necessary that a patient should be ignorant of the medicine he takes, to be cured by it, than that the business of government should be conducted with secrecy, in order to insure obedience to just laws. Much less is it necessary that the means of life should be prescribed in a dead language, or dictated with the solemn pomp of a necromancer. The effects of imposture, in every thing, are like the artificial health produced by the use of ardent spirits. Its vigour is temporary, and is always followed by misery and death.

The belief that the yellow fever and the plague are necessarily mortal, is as much the effect of a superstitious torpor in the understanding, as the ancient belief that the epilepsy was a supernatural disease, and that it was an offence against heaven to attempt to cure it. It is partly from the influence of this torpor in the minds of some people, that the numerous cures of the yellow fever, performed by a few simple remedies, were said to be of *other* diseases. It is necessary, for the conviction of such persons, that patients should always *die* of that, and other dangerous disease, to prove that they have been affected by them.

The repairs which our world is destined to undergo will be incomplete, until pestilential fevers cease to be numbered among the widest outlets of human life.

There are many things which are now familiar to women and children, which were known a century ago only to a few men who lived in closets, and were distinguished by the name of philosophers.

We teach a hundred things in our schools less useful, and many things more difficult, than the knowledge that would be necessary to cure a yellow fever or the plague.

In my attempts to teach the citizens of Philadelphia, by my different publications, the method of curing themselves of yellow fever, I observed no difficulty in their apprehending every thing that was addressed to them, except what related to the different states of the pulse. All the knowledge that is necessary to discover when blood-letting is proper, might be taught to a boy or girl of twelve years old in a few hours. I taught it in less time to several persons, during the prevalence of the epidemic.

I would as soon believe that ratafia was intended by the Author of nature to be the only drink of man, instead of water, as believe that the knowledge of what relates to the health and lives of a *whole* city, or nation, should be confined to one, and that a small or a privileged order of men. But what have physicians, what have universities or medical societies done, after the labours and studies of many centuries, towards lessening the mortality of pestilential fevers? They have either copied or contradicted each other, in all their publications. Plagues and malignant fevers are still leagued with war and famine, in their ravages upon human life.

To prevent the formation and mortality of this fever, it will be necessary, when it makes its appearance in a city or country, to publish an account of those symptoms, which I have called the precursors of the disease, and to exhort the people, as soon as they feel those symptoms, to have immediate recourse to the remedies of purging or bleeding. The danger of delay in using one, or both these remedies, should be inculcated in the strongest terms, for the disease, like Time, has a lock on its forehead, but is bald behind. The bite of a rattle-snake is seldom fatal, because the medicines which cure it are applied or taken as soon as the

poison comes in contact with the blood. There is less danger to be apprehended from the yellow fever than from the poison of the snake, provided the remedies for it are administered within a few hours after it is excited into action.

Let persons who are subject to chronic pains, or diseases of any kind, be advised not to be deceived by them. Every pain, at such a time, is the beginning of the disease; for it always acts first on debilitated parts of the body. From an ignorance of this law of epidemics many persons, by delaying their applications for help, perished with our fever.

Let nature be trusted in no case whatever, to cure this disease; and let no attack of it, however light, be treated with neglect. Death as certainly performs his work, when he steals on the system in the form of a mild intermittent, as he does, when he comes on with the symptoms of apoplexy, or a black vomiting.

Cleanliness, in houses and dress, cannot be too often inculcated during the prevalence of a yellow fever.

Let it not be supposed, that I mean that the history which I have given of the method of cure of this epidemic, should be applied, in all its parts, to the yellow fevers which may appear hereafter in the United States, or which exist at all times in the West-India Islands. Season and climate vary this, as well as all other diseases. Bark and wine, so fatal in this, may be proper in a future yellow fever. But in the climate of the United States, I believe it will seldom appear with such symptoms of prostration and weakness, as not to require, in its first stage, evacuations of some kind.

The only inquiry, when the disease makes its appearance, should be, from what part of the body these evacuations should be procured; the order which should be pursued in obtaining them; and the quantity of each of the matters to be discharged, which should be withdrawn at a time.

Thus far did I venture, from my theory of the disease, and from the authorities of Dr. Hillary and Dr. Mosely, to decide in favour of evacuations in the yellow fever; but Dr. Wade and Mr. Chisholm again support me, by their practice in the fevers of the East and West-Indies. They both gave strong mercurial purges, and bled in some cases. Dr. Wade confirmed, by his practice, the advantage of *gra-*

dually abstracting stimulus from the system. He never drew blood, even in the most inflammatory cases, until he had first discharged the contents of the bowels. The doctor has further established the efficacy of a vegetable diet and of water as a drink, as the best means of preventing disease in a hot climate.

The manner in which the miasmata that produce the plague act upon the system is so much like that which has been described in the yellow fever, and the accounts of the efficacy of low diet, in preparing the body for its reception, and of copious bleeding, cold air and cold water, in curing it, are so similar, that all the directions which relate to preventing, mitigating, or curing the yellow fever may be applied to it. The fluids in the plague show a greater tendency to the skin, than they do in the yellow fever. Perhaps, upon this account, the early use of powerful sudorifics may be more proper in the former than in the latter disease. From the influence of early purging and bleeding in promoting sweats in the yellow fever, there can be little doubt but the efforts of nature to unload the system in the plague, through the channel of the pores, might be accelerated by the early use of the same remedies. One thing, with respect to the plague, is certain, that its cure depends upon the abstraction of stimulus, either by means of plentiful sweats, or of purulent matter from external sores. Perhaps the efficacy of these remedies depends wholly upon their elevating the system from its prostrated state in a *gradual* manner. If this be the case, those natural discharges might be easily and effectually imitated by small and repeated bleedings.

To correspond in quantity with the discharge from the skin, blood-letting in the plague, when indicated, should be copious. A profuse sweat, continued for twenty-four hours, cannot fail of wasting many pounds of the fluids of the body. This was the duration of the critical sweats in the famous plague which was known by the name of the English sweating sickness, and which made its appearance in the army of Henry VII. in Milford-Haven, in Wales, and spread from thence through every part of the kingdom.

The principles which lead to the prevention and cure of the yellow fever and the plague, apply with equal force to the mitigation of the measles, and to the prevention or mitigation of the scarlatina anginosa, the dysentery, and the

inflammatory jail fever. I have remarked elsewhere,* that a previous vegetable diet lessened the violence and danger of the measles. Dr. Sims taught me, many years ago, to prevent or mitigate the scarlatina anginosa, by means of gentle purges, after children are infected by it.† Purges of salts have, in many instances, preserved whole families and neighbourhoods from the dysentery, where they have been exposed to its remote cause. During the late American war, an emetic seldom failed of preventing an attack of the hospital fever, when given in its forming state.‡ I have had no experience of the effects of previous evacuations in abating the violence, or preventing the mortality of the malignant sore throat, but I can have no doubt of their efficacy, from the sameness of the state of the system in that disease, as in other malignant fevers. The debility induced in it is from depression, and the supposed symptoms of putrefaction are nothing but the disguised effects of a sudden and violent pressure of an inflammatory stimulus upon the arterial system.

With these observations I close the history of the rise, progress, symptoms, and treatment of the bilious remitting yellow fever, which appeared in Philadelphia, in the year 1793. My principal aim has been to revive and apply to it, the principles and practice of Dr. Sydenham, and, however coldly those principles and that practice may be received by some physicians of the present day, I am convinced that experience, in all ages and in all countries, will vouch for their truth and utility.

* Vol. ii.

† Medical Memoirs, vol. i.

‡ Vol. i.

A NARRATIVE

OF THE

STATE OF THE BODY AND MIND OF THE AUTHOR, DURING THE
PREVALENCE OF THE FEVER.

NARRATIVES of escapes from great dangers of shipwreck, war, captivity, and famine, have always formed an interesting part of the history of the body and mind of man. But there are deliverances from equal dangers, which have hitherto passed unnoticed; I mean from pestilential fevers. I shall briefly describe the state of my body and mind during my intercourse with the sick in the epidemic of 1793. The account will throw additional light upon the disease, and probably illustrate some of the laws of the animal economy: It will, moreover, serve to furnish a lesson to all who may be placed in similar circumstances, to commit their lives, without fear, to the protection of that Being, who is able to save to the uttermost, not only from future, but from present evil.

Some time before the fever made its appearance, my wife and children went into the state of New-Jersey, where they had long been in the habit of spending the summer months. My family, about the 25th of August, consisted of my mother, sister, who was on a visit to me, a black servant man, and a mulatto boy. I had five pupils, viz. Warner Washington and Edward Fisher, of Virginia; John Alston, of South-Carolina, and John Redman Coxe (grandson to Dr. Redman) and John Stall, both of this city. They all crowded around me upon the sudden increase of business, and with one heart devoted themselves to my service, and to the cause of humanity.

The credit which the new mode of treating the disease acquired, in all parts of the city, produced an immense influx of patients to me from all quarters. My pupils were constantly employed; at first in putting up purging pow-

ders, but, after a while, only in bleeding and visiting the sick.

Between the 8th and the 15th of September, I visited and prescribed for between a hundred and a hundred and twenty patients a day. Several of my pupils visited a fourth or fifth part of that number. For a while we refused no calls. In the short intervals of business, which I spent at my meals, my house was filled with patients, chiefly the poor, waiting for advice. For many weeks I seldom ate without prescribing for numbers as I sat at my table. To assist me at these hours, as well as in the night, Mr. Stall, Mr. Fisher, and Mr. Coxe accepted of rooms in my house, and became members of my family. Their labours now had no remission.

Immediately after I adopted the antiphlogistic mode of treating the disease, I altered my manner of living. I left off drinking wine and malt liquors. The good effects of the disuse of these liquors helped to confirm me in the theory I had adopted of the disease. A troublesome head-ach, which I had occasionally felt, and which excited a constant apprehension that I was taking the fever, now suddenly left me. I likewise, at this time, left off eating solid animal food, and lived wholly, but sparingly, upon weak broth, potatoes, raisins, coffee, and bread and butter.

From my constant exposure to the sources of the disease, my body became highly impregnated with miasmata. My eyes were yellow, and sometimes a yellowness was perceptible in my face. My pulse was preternaturally quick, and I had profuse sweats every night. These sweats were so offensive, as to oblige me to draw the bed-clothes close to my neck, to defend myself from their smell. They lost their fœtor entirely, upon my leaving off the use of broth, and living entirely upon milk and vegetables. But my nights were rendered disagreeable, not only by these sweats, but by the want of my usual sleep, produced in part by the frequent knocking at my door, and in part by anxiety of mind, and the stimulus of the miasmata upon my system. I went to bed in conformity to habit only, for it ceased to afford me rest or refreshment. When it was evening I wished for morning; and when it was morning, the prospect of the labours of the day, at which I often shuddered, caused me to wish for the return of evening. The de-

grees of my anxiety may be easily conceived when I add, that I had at one time upwards of thirty heads of families under my care; among these were Mr. Josiah Coates, the father of eight, and Mr. Benjamin Scull and Mr. John Morrell, both fathers of ten children. They were all in imminent danger; but it pleased God to make me the instrument of saving each of their lives. I rose at six o'clock, and generally found a number of persons waiting for advice in my shop or parlour. Hitherto the success of my practice gave a tone to my mind, which imparted preternatural vigour to my body. It was meat and drink to me to fulfil the duties I owed to my fellow-citizens, in this time of great and universal distress. From a hope that I might escape the disease, by avoiding every thing that could excite it into action, I carefully avoided the heat of the sun, and the coldness of the evening air. I likewise avoided yielding to every thing that should raise or depress my passions. But at such a time, the events which influence the state of the body and mind are no more under our command than the winds or weather. On the evening of the 14th of September, after eight o'clock, I visited the son of Mrs. Berriman, near the Swedes' church, who had sent for me early in the morning. I found him very ill. He had been bled in the forenoon, by my advice, but his pulse indicated a second bleeding. It would have been difficult to procure a bleeder at that late hour. I therefore bled him myself. Heated by this act, and debilitated by the labours of the day, I rode home in the evening air. During the ensuing night I was much indisposed. I rose, notwithstanding, at my usual hour. At eight o'clock I lost ten ounces of blood, and immediately afterwards got into my chair, and visited between forty and fifty patients before dinner. At the house of one of them I was forced to lie down a few minutes. In the course of this morning's labours my mind was suddenly thrown off its pivots, by the last look, and the pathetic cries, of a friend for help, who was dying under the care of a French physician. I came home about two o'clock, and was seized, immediately afterwards, with a chilly fit and a high fever. I took a dose of the mercurial medicine, and went to bed. In the evening I took a second purging powder, and lost ten ounces more of blood. The next morning I bathed my face, hands,

and feet, in cold water for some time. I drank plentifully, during the day and night, of weak hyson tea, and of water, in which currant jelly had been dissolved. At eight o'clock I was so well as to admit persons who came for advice into my room, and to receive reports from my pupils of the state of as many of my patients as they were able to visit; for, unfortunately, they were not able to visit them all (with their own) in due time; in consequence of which several died. The next day I came down stairs, and prescribed in my parlour for not less than a hundred people. On the 19th of the same month, I resumed my labours, but in great weakness. It was with difficulty that I ascended a pair of stairs, by the help of a banister. A slow fever, attended with irregular chills, and a troublesome cough, hung constantly upon me. The fever discovered itself in the heat of my hands, which my patients often told me were warmer than their own. The breath and exhalations from the sick now began to affect me, in small and infected rooms, in the most sensible manner. On the morning of the 4th of October I suddenly sunk down, in a sick room, upon a bed, with a giddiness in my head. It continued for a few minutes, and was succeeded by a fever, which confined me to my house the remaining part of the day.

Every moment in the intervals of my visits to the sick was employed in prescribing, in my own house, for the poor, or in sending answers to messages from my patients; time was now too precious to be spent in counting the number of persons who called upon me for advice. From circumstances I believe it was frequently 150, and seldom less than 50 in a day, for five or six weeks. The evening did not bring with it the least relaxation from my labours. I received letters every day from the country, and from distant parts of the Union, containing inquiries into the mode of treating the disease, and after the health and lives of persons who had remained in the city. The business of every evening was to answer these letters, also to write to my family. These employments, by affording a fresh current to my thoughts, kept me from dwelling on the gloomy scenes of the day. After these duties were performed, I copied into my note book all the observations I had collected during the day, and which I had marked

with a pencil in my pocket-book in sick rooms, or in my carriage. To these constant labours of body and mind were added distresses from a variety of causes. Having found myself unable to comply with the numerous applications that were made to me, I was obliged to refuse many every day. My sister counted forty-seven in one forenoon before eleven o'clock. Many of them left my door with tears, but they did not feel more distress than I did from refusing to follow them. Sympathy, when it vents itself in acts of humanity, affords pleasure, and contributes to health; but the reflux of pity, like anger, gives pain, and disorders the body. In riding through the streets, I was often forced to resist the intreaties of parents imploring a visit to their children, or of children to their parents. I recollect, and even *yet* with pain, that I tore myself at one time from five persons in Moravian alley, who attempted to stop me, by suddenly whipping my horse, and driving my chair as speedily as possible beyond the reach of their cries.

The solicitude of the friends of the sick for help may further be conceived of, when I add, that the most extravagant compensations were sometimes offered for medical services, and, in one instance, for only a single visit. I had no merit in refusing these offers, and I have introduced an account of them only to inform such physicians as may hereafter be thrown into a similar situation, that I was favoured with an exemption from the fear of death, in proportion as I subdued every selfish feeling, and laboured exclusively for the benefit of others. In every instance in which I was forced to refuse these pathetic and earnest applications, my distress was heightened by the fear that the persons, whom I was unable to visit, would fall into improper hands, and perish by the use of bark, wine, and laudanum.

But I had other afflictions besides the distress which arose from the abortive sympathy which I have described. On the 11th of September, my ingenious pupil, Mr. Washington, fell a victim to his humanity. He had taken lodgings in the country, where he sickened with the disease. Having been almost uniformly successful in curing others, he made light of his fever, and concealed the knowledge of his danger from me, until the day before he died.

On the 18th of September Mr. Stall sickened in my house. A delirium attended his fever from the first hour it affected him. He refused, and even resisted force when used to compel him to take medicine. He died on the 23d of September.* Scarce had I recovered from the shock of the death of this amiable youth, when I was called to weep for a third pupil, Mr. Alston, who died in my neighbourhood the next day. He had worn himself down, before his sickness, by uncommon exertions in visiting, bleeding, and even sitting up with sick people. At this time Mr. Fisher was ill in my house. On the 26th of the month, at 12 o'clock, Mr. Coxe, my only assistant was seized with the fever, and went to his grand-father's. I followed him with a look, which I feared would be the last in my house. At two o'clock my sister, who had complained for several days, yielded to the disease, and retired to her bed. My mother followed her, much indisposed, early in the evening. My black servant man had been confined with the fever for several days, and had on that day, for the first time quitted his bed. My little mulatto boy, of eleven years old, was the only person in my family who was able to afford me the least assistance. At eight o'clock in the evening I finished the business of the day. A solemn stillness at that time pervaded the streets. In vain did I strive to forget my melancholy situation by answering letters and by putting up medicines, to be distributed next day among my patients. My faithful black man crept to my door, and at my request sat down by the fire, but he

* This accomplished youth had made great attainments in his profession. He possessed, with an uncommon genius for science, talents for music, painting, and poetry. The following copy of an unfinished letter to his father (who had left the city) was found among his papers after his death. It shows that the qualities of his heart were equal to those of his head.

"Philadelphia, September 15, 1793.

"MY DEAR FATHER,

"I take every moment I have to spare to write to you, which is not many; but you must excuse me, as I am doing good to my fellow-creatures. At this time, every moment I spend in idleness might probably cost a life. The sickness increases every day, but most of those who die, die for want of good attendance. We cure all we are called to on the first day, who are well attended, but so many doctors are sick, the poor creatures are glad to get a doctor's servant."

added, by his silence and dulness, to the gloom, which suddenly overpowered every faculty of my mind.

On the first day of October, at two o'clock in the afternoon, my sister died. I got into my carriage within an hour after she expired, and spent the afternoon in visiting patients. According as a sense of duty, or as grief has predominated in my mind, I have approved, and disapproved, of this act, ever since. She had borne a share in my labours. She had been my nurse in sickness, and my casuist in my choice of duties. My whole heart reposed itself in her friendship. Upon being invited to a friend's house in the country, when the disease made its appearance in the city, she declined accepting the invitation, and gave as a reason for so doing, that I might probably require her services in case of my taking the disease, and that, if she were sure of dying, she would remain with me, provided that, by her death, she could save my life. From this time I declined in health and strength. All motion became painful to me. My appetite began to fail. My night sweats continued. My short and imperfect sleep was disturbed by distressing or frightful dreams. The scenes of them were derived altogether from sick rooms and grave yards. I concealed my sorrows as much as possible from my patients; but when alone, the retrospect of what was past, and the prospect of what was before me, the termination of which was invisible, often filled my soul with the most poignant anguish. I wept frequently when retired from the public eye, but I did not weep over the lost members of my family alone. I beheld or heard every day of the deaths of citizens, useful in public, or amiable in private life. It was my misfortune to lose as patients the Rev. Mr. Fleming and Mr. Graesel, both exhausted by their labours of piety and love among the poor, before they sickened with the disease. I saw the last struggles of departing life in Mr. Powell, and deplored, in his death, an upright and faithful servant of the public, as well as a sincere and affectionate friend. Often did I mourn over persons who had, by the most unparalleled exertions, saved their friends and families from the grave, at the expense of their own lives. Many of these martyrs to humanity were in humble stations. Among the members of my profession, with whom I have been most intimately connected, I

had daily cause of grief and distress. I saw the great and expanded mind of Dr. Pennington, shattered by delirium, just before he died. He was to me dear and beloved, like a younger brother. He was, moreover, a Joab in the contest with the disease. Philadelphia must long deplore the premature death of this excellent physician. Had he lived a few years longer, he would have filled an immense space in the republic of medicine.* It was my affliction to see my friend Dr. John Morris breathe his last, and to hear the first effusions of the most pathetic grief from his mother, as she bursted from the room in which he died. But I had distress from the sickness, as well as the deaths of my brethren in physic. My worthy friends, Dr. Griffiths, Dr. Say, and Dr. Mease, were suspended by a thread over the grave, nearly at the same time. Heaven, in mercy to me, as well as in kindness to the public and their friends, preserved their lives. Had they died, the measure of my sorrows would have been complete.

I have said before, that I early left off drinking wine; but I used it in another way. I carried a little of it in a vial in my pocket, and when I felt myself fainty, after coming out of a sick room, or after a long ride, I kept about a table spoonful of it in my mouth for half a minute, or longer, without swallowing it. So weak and excitable was my system, that this small quantity of wine refreshed and invigorated me as much as half a pint would have done at any other time. The only difference was, that the vigour I derived from the wine in the former, was of shorter duration than when taken in the latter way.

For the first two weeks after I visited patients in the yellow fever, I carried a rag wetted with vinegar, and smelled it occasionally in sick rooms: but after I saw and felt the signs of the universal presence of miasmata in my system, I laid aside this and all other precautions. I rested myself on the bed-side of my patients, and I drank milk or eat fruit in their sick rooms. Besides being saturated with miasmata, I had another security against being infected in sick rooms, and that was, I went into scarcely a

* Before he finished his studies in medicine, he published a volume of ingenious and patriotic "Chemical and Economical Essays, designed to illustrate the connection between the theory and practice of chemistry, and the application of that science to some of the arts and manufactures of the United States of America."

house which was more infected than my own. Many of the poor people, who called upon me for advice, were bled by my pupils in my shop, and in the yard which was between it and the street. From the want of a sufficient number of bowls to receive their blood, it was sometimes suffered to flow and putrefy upon the ground. From this source, streams of miasmata were constantly poured into my house, and conveyed into my body by the air, during every hour of the day and night.

The deaths of my pupils and sister have often been urged as objections to my mode of treating the fever. Had the same degrees of labour and fatigue, which preceded the attack of the yellow fever in each of them, preceded an attack of a common pleurisy, I think it probable that some, or perhaps all of them, would have died with it. But when the influence of the concentrated miasmata which filled my house was added to that of constant fatigue upon their bodies, what remedies could be expected to save their lives? Under the above circumstances, I consider the recovery of the other branches of my family from the fever (and none of them escaped it) with emotions, such as I should feel had we all been revived from apparent death by the exertions of a humane society.

For upwards of six weeks I did not taste animal food, nor fermented liquors of any kind. The quantity of aliment which I took, inclusive of drinks, during this time, was frequently not more than one or two pounds in a day. Yet upon this diet I possessed, for a while, uncommon activity of body. This influence of abstinence upon bodily exertion has been happily illustrated by Dr. Jackson, in his directions for preserving the health of soldiers in hot climates. He tells us, that he walked a hundred miles in three days, in Jamaica, during which time he breakfasted on tea, supped on bread and salad, and drank nothing but lemonade or water. He adds further, that he walked from Edinburgh to London in eleven days and a half, and that he travelled with the most ease when he only breakfasted and supped, and drank nothing but water. The fatigue of riding on horseback is prevented or lessened by abstinence from solid food. Even the horse suffers least from a quick and long journey when he is fed sparingly with hay. These facts add weight to the arguments formerly

adduced, in favour of vegetable diet, in preventing or mitigating the action of the miasmata of malignant fevers upon the system. In both cases the abstraction of stimulus removes the body further from the reach of undue excitement and morbid depression.

Food supports life as much by its stimulus, as by affording nourishment to the body. Where an artificial stimulus acts upon the system, the natural stimulus of food ceases to be necessary. Under the influence of this principle, I increased or diminished my food with the signs I discovered of the increase or diminution of the seeds of the disease in my body. Until the 15th of September I drank weak coffee, but after that time I drank nothing but milk, or milk and water, in the intervals of my meals. I was so satisfied of the efficacy of this mode of living, that I believed life might have been preserved, and a fever prevented, for many days, with a much greater accumulation of miasmata in my system, by means of a total abstinence from food. Poison is a relative term, and an excess in quantity, or a derangement in place, is necessary to its producing deleterious effects. The miasmata of the yellow fever produced sickness and death only from the excess of their quantity, or from their force being increased by the addition of those other stimuli which I have elsewhere called exciting causes.

In addition to low diet, as a preventive of the disease, I obviated costiveness by taking occasionally a calomel pill, or by chewing rhubarb.

I had read and taught, in my lectures, that fasting increases acuteness in the sense of touch. My low living had that effect, in a certain degree, upon my fingers. I had a quickness in my perception, of the state of the pulse in the yellow fever, that I had never experienced before in any other disease. My abstemious diet, assisted perhaps by the state of my feelings, had likewise an influence upon my mind. Its operations were performed with an ease and a celerity, which rendered my numerous and complicated duties much less burdensome than they would probably have been under other circumstances of diet, or a less agitated state of my passions.

My perception of the lapse of time was new to me. It was uncommonly slow. The ordinary business and pur-

suits of men appeared to me in a light that was equally new. The hearse and the grave mingled themselves with every view I took of human affairs. Under these impressions I recollect being as much struck with observing a number of men, employed in digging the cellar of a large house, as I should have been, at any other time, in seeing preparations for building a palace upon a cake of ice. I recollect, further, being struck with surprise, about the 1st of October, in seeing a man busily employed in laying in wood for the approaching winter. I should as soon have thought of making provision for a dinner on the first day of the year 1800.

In the account of my distresses, I have passed over the slanders which were propagated against me by some of my brethren. I have mentioned them only for the sake of declaring, in this public manner, that I most heartily forgive them; and that if I discovered, at any time, an undue sense of the unkindness and cruelty of those slanders, it was not because I felt myself injured by them, but because I was sure they would irreparably injure my fellow-citizens, by lessening their confidence in the only remedies that I believed to be effectual in the reigning epidemic. One thing in my conduct towards these gentlemen may require justification; and that is, my refusing to consult with them. A Mahometan and a Jew might as well attempt to worship the Supreme Being in the same temple, and through the medium of the same ceremonies, as two physicians of opposite principles and practice attempt to confer about the life of the same patient. What is done in consequence of such negotiations (for they are not consultations) is the ineffectual result of neutralized opinions; and wherever they take place, should be considered as the effect of a criminal compact between physicians, to assess the property of their patients, by a shameful prostitution of the dictates of their consciences. Besides, I early discovered that it was impossible for me, by any reasonings, to change the practice of some of my brethren. Humanity was, therefore, on the side of leaving them to themselves; for the extremity of *wrong* in medicine, as in morals and government, is often a less mischief than that mixture of *right* and *wrong* which serves, by palliating, to perpetuate evil.

After the loss of my health I received letters from my

friends in the country, pressing me, in the strongest terms, to leave the city. Such a step had become impracticable. My aged mother was too infirm to be removed, and I could not leave her. I was, moreover, part of a little circle of physicians, who had associated themselves in support of the new remedies. This circle would have been broken by my quitting the city. The weather varied the disease, and, in the weakest state of my body, I expected to be able, from the reports of my pupils, to assist my associates in detecting its changes, and in accommodating our remedies to them. Under these circumstances it pleased God to enable me to reply to one of the letters that urged my retreat from the city, that "I had resolved to stick to my principles, my practice, and my patients, to the last extremity."

On the 9th of October, I visited a considerable number of patients, and, as the day was warm, I lessened the quantity of my clothing. Towards evening I was seized with a pain in the back, which obliged me to go to bed at eight o'clock. About twelve I awoke with a chilly fit. A violent fever, with acute pains in different parts of my body, followed it. At one o'clock I called for Mr. Fisher, who slept in the next room. He came instantly, with my affectionate black man, to my relief. I saw my danger painted in Mr. Fisher's countenance. He bled me plentifully, and gave me a dose of the mercurial medicine. This was immediately rejected. He gave me a second dose, which likewise acted as an emetic, and discharged a large quantity of bile from my stomach. The remaining part of the night was passed under an apprehension that my labours were near an end. I could hardly expect to survive so violent an attack of the fever, broken down, as I was, by labour, sickness, and grief. My wife and seven children, whom the great and distressing events that were passing in our city had jostled out of my mind for six or seven weeks, now resumed their former place in my affections. My wife had stipulated, in consenting to remain in the country, to come to my assistance in case of my sickness; but I took measures which, without alarming her, proved effectual in preventing it. My house was enveloped in foul air, and the probability of my death made her life doubly necessary to my family. In the morning the medicine operated kindly,

and my fever abated. In the afternoon it returned, attended with a great inclination to sleep. Mr. Fisher bled me again, which removed the sleepiness. The next day the fever left me, but in so weak a state, that I awoke two successive nights with a faintness which threatened the extinction of my life. It was removed each time by taking a little aliment. My convalescence was extremely slow. I returned, in a very gradual manner, to my former habits of diet. The smell of animal food, the first time I saw it at my table, forced me to leave the room. During the month of November, and all the winter months, I was harassed with a cough, and a fever somewhat of the hectic kind. The early warmth of the spring removed those complaints, and restored me, through Divine Goodness, to my usual state of health.

I should be deficient in gratitude, were I to conclude this narrative without acknowledging my obligations to my surviving pupils, Mr. Fisher and Mr. Coxe, for the great support and sympathy I derived from them in my labours and distresses.

I take great pleasure likewise in acknowledging my obligations to my former pupil, Dr. Woodhouse, who assisted me in the care of my patients, after I became so weak as not to be able to attend them with the punctuality their cases required. The disinterested exploits of these young gentlemen in the cause of humanity, and their success in the treatment of the disease, have endeared their names to hundreds, and, at the same time, afforded a prelude of their future eminence and usefulness in their profession.

But wherewith shall I come before the great FATHER and REDEEMER of men, and what shall I render unto Him for the issue of my life from the grave?

———Here all language fails:———
Come then, expressive silence, muse his praise.

AN ACCOUNT
OF THE
BILIOUS REMITTING AND INTERMITTING
YELLOW FEVER,
AS IT
APPEARED IN PHILADELPHIA.
IN THE YEAR 1794.

AN ACCOUNT, &c.

I CONCLUDED the history of the symptoms of the bilious remittent yellow fever, as it appeared in Philadelphia, in the year 1793, by taking notice, that the diseases which succeeded that fatal epidemic were all of a highly inflammatory nature.

In that history I described the weather and diseases of the months of March and April, in the spring of 1794.

The weather, during the first three weeks of the month of May, was dry and temperate, with now and then a cold day and night. The strawberries were ripe on the 15th, and cherries on the 22d, day of the month, in several of the city gardens. A shower of hail fell on the afternoon of the 22d, which broke the glass windows of many houses. A single stone of this hail was found to weigh two drachms. Several people collected a quantity of it, and preserved it till the next day in their cellars, when they used it for the purpose of cooling their wine. The weather, after this hail storm, was rainy during the remaining part of the month. The diseases were still inflammatory. Many persons were afflicted with a sore mouth in this month.

The weather in June was pleasant and temperate. Several intermittents, and two very acute pleurisies, occurred in my practice during this month. The intermittents were uncommonly obstinate, and would not yield to the largest doses of the bark.

In a son of Mr. Samuel Coates, of seven years old, the bark produced a sudden translation of this state of fever to the head, where it produced all the symptoms of the first stage of internal dropsy of the brain. This once formidable disease yielded, in this case, to three bleedings, and other depleting medicines. The blood drawn in every instance was sily.

From the inflammatory complexion of the diseases of the spring, and of the beginning of June, I expected the fevers of the summer and autumn would be of a violent and malignant nature. I was the more disposed to entertain this opinion from observing the stagnating filth of the gutters of our city; for the citizens of Philadelphia, having an interest in rejecting the proofs of the generation of the epidemic of 1793 in their city, had neglected to introduce the regulations which were necessary to prevent the production of a similar fever from domestic putrefaction. They had, it is true, taken pains to remove the earth and offal matters which accumulated in the streets; but these, from their being always dry, were inoffensive as remote causes of disease. Perhaps the removal of the earth did harm, by preventing the absorption of the miasmata which were constantly exhaled from the gutters.

On the 6th of June, Dr. Physick called upon me, and informed me that he had a woman in the yellow fever under his care. The information did not surprise me, but it awakened suddenly in my mind the most distressing emotions. I advised him to inform the mayor of the city of the case, but by no means to make it more public, for I hoped that it might be a sporadic instance of the disease, and that it might not become general in the city.

On the 12th of the month, my fears of the return of the yellow fever were revived by visiting Mr. Isaac Morris, whom I found very ill with a violent puking, great pain in his head, a red eye, and a slow tense pulse. I ordered him to be bled, and purged him plentifully with jalap and calomel. His blood had that appearance which has been compared by authors to the washings of raw flesh in water. Upon his recovery, he told me that he "suspected he had had the yellow fever, for that his feelings were exactly such as they had been in the fall of 1793, at which time he had an attack of that disease."

On the 14th of June, I was sent for, in the absence of Dr. Mease, to visit his sister in a fever. Her mother, who had become intimately acquainted with the yellow fever, by nursing her son and mother in it, the year before, at once decided upon the name of her daughter's disease. Her symptoms were violent, but they appeared in an intermitting form. Each paroxysm of her fever was like a hurri-

cane to her whole system. It excited apprehensions of immediate dissolution in the minds of all her friends. The loss of sixty ounces of blood, by five bleedings, copious doses of calomel and jalap, and a large blister to her neck, soon vanquished this malignant intermittent, without the aid of a single dose of bark.

During the remaining part of the month, I was called to several cases of fever, which had symptoms of malignity of a suspicious nature. The son of Mr. Andrew Brown had an hæmorrhage from his nose in a fever, and a case of menorrhagia occurred in a woman, who was affected with but a slight degree of fever.

In the course of this month, I met with several cases of swelled testicles, which had succeeded fevers, so slight as to have required no medical aid. Dr. Desportes records similar instances of a swelling in the testicles, which appeared during the prevalence of the yellow fever in St. Domingo, in the year 1741.*

In the month of July, I visited James Lefferty and William Adams, both of whom had, with the usual symptoms of yellow fever, a yellow colour on their skin. I likewise attended three women, in whom I discovered the disease under forms in which I had often seen it in the year 1793. In two of them it appeared with symptoms of a violent colic, which yielded only to frequent bleedings. In the third, it appeared with symptoms of pleurisy, which was attended with a constant hæmorrhage from the uterus, although blood was drawn almost daily from her arm, for six or seven days. About the middle of this month many people complained of nausea, which in some cases produced a puking, without any symptoms of fever.

During the month of August, I was called to Peter Denham, Mrs. Bruce, a son of Jacob Gribble, Mr. Cole, John Madge, Mrs. Gardiner, Miss Purdon, Mrs. Gavin, and Benjamin Cochran, each of whom had all the usual symptoms of the yellow fever. I found Mr. Cochran sitting on the side of his bed, with a pot in his hand, into which he was discharging black matter from his stomach, on the 6th day of the disease. He died on the next day. Mrs. Gavin died on the 6th day of her disease, from a want of sufficient bleeding, to which she objected, from the in-

* Histoire des Maladies de Saint Domingue, p. 112.

fluence of her friends. Besides the above persons, I visited Mr. George Eyre, at Kensington, Mr. Thomas Fitzsimmons, and Thomas M'Kean, jun. son of the chief justice of Pennsylvania, all of whom had the disease, but in a moderate degree. During this time I took no steps to alarm my fellow-citizens with the unwelcome news of its being in town. But my mind was not easy in this situation, for I daily heard of persons who died of the disease, who might probably have been saved had they applied early for relief, or had a suspicion become general among all our physicians of the existence of the yellow fever in the city. The cholera infantum was common during this, and part of the preceding month. It was more obstinate and more fatal than in common years.

On the 12th of this month, a letter from Baltimore announced the existence of the yellow fever in that city. One of the patients whom I visited in this month, in the fever, Mr. Cole, brought the seeds of it in his body from that place.

On the 25th of the month, two members of the committee, lately appointed by the government of the state, for taking care of the health of the city, called upon me to know whether the yellow fever was in town. I told them it was, and mentioned some of the cases that had come under my notice; but informed them, at the same time, that I had seen no case in which it had been contagious, and that, in every case where I had been called early, and where my prescriptions had been followed, the disease had yielded to medicine.

On the 29th of the month, I received an invitation to attend a meeting of the committee of health, at their office in Walnut street. They interrogated me respecting the intelligence I had given to two of their members on the 25th. I repeated it to them, and mentioned the names of all the persons I had attended in the yellow fever, since the 9th of June.

Neither this, nor several subsequent communications to the committee of health, produced the effect that was intended by them. Dr. Physick and Dr. Dewees supported me in my declaration, but their testimony did not protect me from the clamours of my fellow-citizens, nor from the calumnies of some of my brethren, who, while they daily

attended or lost patients in the yellow fever, called it by the less unpopular names of

1. A common intermittent. 2. A bilious fever. 3. An inflammatory remitting fever. 4. A putrid fever. 5. A nervous fever. 6. A dropsy of the brain. 7. A lethargy. 8. Pleurisy. 9. Gout. 10. Rheumatism. 11. Colic. 12. Dysentery. And 13. Sore throat.

It was said further, by several of the physicians of the city, not to be the yellow fever, because some who had died of it had not a sighing in the beginning, and a black vomiting in the close of the disease. Even where the black vomiting and yellow skin occurred, they were said not to constitute a yellow fever, for that those symptoms occurred in other fevers.

Let not the reader complain of the citizens and physicians of Philadelphia alone. A similar conduct has existed in all cities upon the appearance of great and mortal epidemics.

Nor is it any thing new for mortal diseases to receive mild and harmless names from physicians. The plague was called a spotted fever, for several months, by some of the physicians of London, in the year 1665.

Notwithstanding the pains which were taken to discredit the report of the existence of the yellow fever in the city, it was finally believed by many citizens, and a number of families in consequence of it left the city. And in spite of the harmless names of intermitting and remitting fever, and the like, which were given to the disease, the bodies of persons who had died of it were conveyed to the grave, in several instances, upon a hearse, the way in which those who died of the yellow fever were buried the year before.

From the influence of occasional showers of rain, in the months of September and October, the disease was frequently checked, so as to disappear altogether for two or three days in my circle of practice. It was observed, that while showers of rain lessened, moist or damp weather, without rain, increased it.

The cold weather in October checked the fever, but did not banish it from the city. It appeared in November, and in all the succeeding winter and spring months. The weather, during these months, being uncommonly moderate,

will account for its not being destroyed at the time in which the disease usually disappeared in former years.

The causes which predisposed to this fever were the same as in the year 1793. Persons of full habits, strangers, and negroes, were most subject to it. It may seem strange to those persons who have read that negroes are seldom affected with this fever in the West-Indies, that they were so much affected by it in Philadelphia. There were two reasons for it. Their manner of living was as plentiful as that of white people in the West-Indies, and they generally resided in alleys and on the skirts of the city, where they were more exposed to noxious exhalation, than in its more open and central parts.

The summer fruits, from being eaten before they were ripe, or in too large a quantity, became frequently exciting causes of this fever. It was awakened in one of my patients by a supper of peaches and milk. Cucumbers, in several instances, gave vigour to the miasmata which had been previously received into the system. Terror excited it in two of my patients. In one of them, a young woman, this terror was produced by hearing, while she sat at dinner, that a hearse had passed by her door with a person on it who had died of the yellow fever. Vexation excited it in a foreign master of a vessel, in consequence of a young woman suddenly breaking an engagement to marry him. The disease terminated fatally in this instance.

It was sometimes unfortunate for patients when the disease was excited by an article of diet, or by any other cause which acted suddenly upon the system; for it led both them, and in some instances their physicians, to confound those exciting causes with its remote cause, and to view the disease without the least relation to the prevailing epidemic. It was from this mistake that many persons were said to die of intemperance, of eating ice creams, and of trifling colds, who certainly died of the yellow fever. The rum, the ice creams, and the changes in the air, in all these cases, acted like sparks of fire which set in motion the quiescent particles of tinder or gunpowder.

I shall now proceed to describe the symptoms which this fever assumed during the periods which have been mentioned. This detail will be interesting to physicians who wish to see how little nature regards the nosological

arrangement of authors, in the formation of the symptoms of diseases, and how much the seasons influence epidemics. A physician, who had practised medicine near sixty years in the city of Philadelphia, declared that he had never seen the dysentery assume the same symptoms in any two *successive* years. The same may be said probably of nearly all epidemic diseases.

In the arrangement of the symptoms of this fever, I shall follow the order I adopted in my Account of the Yellow Fever of 1793, and describe them as they appeared in the sanguiferous system, the liver, lungs, and brain, the alimentary canal, the secretions and excretions, the nervous system, the senses and appetites, upon the skin, and in the blood.

Two premonitory symptoms struck me this year, which I did not observe in 1793. One of them was a frequent discharge of pale urine, for a day or two before the commencement of the fever; the other was sleep unusually sound, the night before the attack of the fever. The former symptom was a precursor of the plague of Bassora, in the year 1773.

I. I observed but few symptoms in the sanguiferous system different from what I have mentioned in the fever of the preceding year. The slow and intermitting pulse occurred in many, and a pulse nearly imperceptible, in three instances. It was seldom very frequent. In John Madge, an English farmer, who had just arrived in our city, it beat only 64 strokes in a minute, for several days, while he was so ill as to require three bleedings a day, and at no time of his fever did his pulse exceed 96 strokes in a minute. In Miss Sally Eyre, the pulse at one time was at 176, and at another time it was at 140; but this frequency of pulse was very rare. In a majority of the cases which came under my notice, where the danger was great, it seldom exceeded 80 strokes in a minute. I have been thus particular in describing the frequency of the pulse, because custom has created an expectation of that part of the history of fevers; but my attention was directed chiefly to the different degrees of *force* in the pulse, as manifested by its tension, fulness, intermissions, and inequality of action. The *hobbling* pulse was common. In John Geraud, I perceived a quick stroke to succeed every two strokes of an

ordinary healthy pulse. The intermitting, chorded, and depressed pulse occurred in many cases. I called it the year before a *sulky* pulse. One of my pupils, Mr. Alexander, called it more properly a *locked* pulse. I think I observed this state of the pulse to occur chiefly in persons in whom the fever came on without a chilly fit.

Hæmorrhages occurred in all the grades of this fever, but less frequently in my practice this year than in the year before. It occurred, after a ninth bleeding, in Miss Sally Eyre, from the nose and bowels. It occurred from the nose, after a sixth bleeding, in Mrs. Gardiner, who was at that time in the sixth month of her pregnancy. This symptom, which was accompanied by a tense and quick pulse, induced me to repeat the bleeding a seventh time. The blood was very sizy. I mention this fact to establish the opinion that hæmorrhages depend upon too much action in the blood-vessels, and that they are not occasioned by a dissolved state of the blood.

There was a disposition at this time to hæmorrhage in persons who were in apparent good health. A private, in a company of volunteers commanded by Major M'Pherson, informed me that three of his messmates were affected by a bleeding at the nose, for several days after they left the city, on their way to quell the insurrection of the western counties of Pennsylvania.

II. The liver did not exhibit the usual marks of inflammation. Perhaps my mode of treating the fever prevented those symptoms of hepatic affection which belong to the yellow fever in tropical climates. The lungs were frequently affected; and hence the disease was in many instances called a pleurisy or a catarrh. This inflammation of the lungs occurred in a more especial manner in the winter season. It was distinguished from the pleurisies of common years by a red eye, by a vomiting of green or yellow bile, by black stools, and by requiring very copious blood-letting to cure it.

The head was affected, in this fever, not only with coma and delirium, but with mania. This symptom was so common as to give rise to an opinion that madness was epidemic in our city. I saw no cause of it which was not connected with other symptoms of the bilious remit-

ting fever. The Rev. Mr. Keating, one of the ministers of the Roman church, informed me that he had been called to visit seven deranged persons in his congregation, in the course of one week, in the month of March. Two of them had made attempts upon their lives. This mania was probably, in each of the above cases, a symptom only of general fever. The dilatation of the pupil was universal in this fever.

Sore eyes were common during the prevalence of this fever. In Mrs. Leaming, this affection of the eyes was attended with a fever of a tertian type.

III. The alimentary canal suffered as usual in this fever. A vomiting was common upon the first attack of the disease. I observed this symptom to be less common after the cold and rainy weather which took place about the first of October.

I have in another place mentioned the influence of the weather upon the symptoms of this disease. In addition to the facts which have been formerly recorded, I shall add one more from Dr. Desportes. He tells us, that in dry weather the disease affects the head, and that the bowels in this case are more obstinately costive than in moist weather. This influence of the atmosphere on the yellow fever will not surprise those physicians who recollect the remarkable passage in Hippocrates, in which he says, that in the violent heats in summer, fevers appeared, but without any sweat; but if a shower, though ever so slight, appeared, a sweat broke out in the beginning.* I observed further, that a vomiting rarely attended those cases in which there was an absence of a chilly fit in the beginning of the fever. The same observation is made by Dr. Desportes.†

The matter discharged by vomiting was green or yellow bile in most cases. Mrs. Jones, the wife of captain Lloyd Jones, and one other person, discharged black bile within one hour after they were attacked by the fever. I have taken notice, in the History of the Yellow Fever of 1793, that a discharge of bile in the beginning of this fever was always a favourable symptom. Dr. Davidson, of St. Vincents, in a letter to me, dated the 22d July, 1794, makes

* Epidemics, book XI. sect. I.

† Les Maladies de St. Domingue, vol. I. p. 193.

the same remark. It shows that the biliary ducts are open, and that the bile is not in that viscid and impacted state which is described in the dissections of Dr. Mitchel.* A distressing pain in the stomach, called by Dr. Cullen gastrodynia, attended in two instances. A burning pain in the stomach, and a soreness to the touch of its whole external region, occurred in three or four cases. Two of them were in March, 1795. In Mrs. Vogles, who had the fever in September, 1794, the sensibility of the pit of the stomach was so exquisite, that she could not bear the weight of a sheet upon it.

Pains in the bowels were very common. They formed the true bilious colic, so often mentioned by West-India writers. In John Madge these pains produced a hardness and contraction of the whole external region of the bowels. They were periodical in Miss Nancy Eyre, and in Mrs. Gardiner, and in both cases were attended with diarrhœa.

Costiveness without pain was common, and, in some cases, so extremely obstinate as to resist, for several days, the successive and alternated use of all the usual purges of the shops.

Flatulency was less common in this fever than in the year 1793.

The disease appeared with symptoms of dysentery in several cases.

IV. The following is an account of the state of the *secretions* and *excretions* in this fever.

A puking of bile was more common this year than in the year 1793. It was generally of a green or yellow colour. I have remarked before, that two of my patients discharged black bile within an hour after they were affected by the fever, and many discharged that kind of matter which has been compared to coffee-grounds, towards the close of the disease.

The fæces were black in most cases where the symptoms of the highest grade of the fever attended. In one very malignant case the most drastic purges brought away, by fifty evacuations, nothing but natural stools. The purges were continued, and finally black fæces were dis-

* Quoted in the Account of the Yellow Fever of 1793.

charged, which produced immediate relief.* In one person the fæces were of a light colour. In this patient the yellowness in the face was of an orange colour, and continued so for several weeks after his recovery.

The urine was, in most cases, high coloured. It was scanty in quantity in Peter Brown, and totally suppressed in John Madge for two days. I ascribed this defect of natural action in the kidneys to an *engorgement* in their blood-vessels, similar to that which takes place in the lungs and brain in this fever. I had for some time entertained this idea of a morbid affection of the kidneys, but I have lately been confirmed in it by the account which Dr. Chisholm gives of the state of one of the kidneys, in a man whom he lost with the Beullam fever, at Granada. "The right kidney (says the doctor) was mortified, although during his illness no symptom of inflammation of that organ was perceived."† It would seem as if the want of action in the kidneys, and a defect in their functions, were not necessarily attended with pain. I recollect to have met with several cases in 1793, in which there was a total absence of pain in a suppression of urine of several days continuance. The same observation is made by Dr. Chisholm, in his account of the Beullam fever of Granada.‡ From this fact it seems probable, that pain is not the effect of any determinate state of animal fibres, but requires the concurrence of morbid or preternatural excitement to produce it. I met with but one case of strangury in this fever. It terminated favourably in a few days. I have never seen death, in a single instance, in a fever from any cause, where a strangury attended, and I have seldom seen a fatal issue to a fever, where this symptom was accidentally produced by a blister. From this fact there would seem to be a connexion between a morbid excitement in the neck of the bladder, and the safety of more vital parts

* In the account of the effects of morbid action and inflammation, in the *Outlines of Phenomena of Fever*, (p. 39,) the author has mentioned the change of certain fluids from their natural to a bark colour. It appears in the secretions of the stomach and bowels, in the bile, in the urine, in carbuncles, and occasionally in the matter, which is produced by blisters. All these changes occur in the yellow fever, and, in common with the other effects of fever that have been enumerated, are the result of peculiar actions in the vessels, derived from *one* cause, viz. morbid excitement.

† *Essay on the Malignant Pestilential Fever introduced into the West-Indies from Beullam*, p. 137.

of the body. The idea of this connexion was first suggested to me, above thirty years ago, by the late Dr. James Leiper, of Maryland, who informed me that he had sometimes cured the most dangerous cases of pleurisy, after the usual remedies had failed, by exciting a strangury, by means of the tincture of Spanish flies mixed with camphorated spirit of wine.

The tongue was always moist in the beginning of the fever, but it was generally of a darker colour than last year. When the disease was left to itself, or treated with bark and wine, the tongue became of a fiery red colour, or dry and furrowed, as in the typhus fever.

Sweats were more common in the remissions of this fever, than they were in the year 1793, but they seldom terminated the disease. During the course of the sweats, I observed a deadly coldness over the whole body to continue in several instances, but without any danger or inconvenience to the patient. In two of the worst cases I attended, there were remissions, but no sweats until the day on which the fever terminated. In several of my patients, the fever wore away without the least moisture on the skin. The *milk*, in one case, was of a greenish colour, such as sometimes appears in the serum of the blood. In another female patient who gave suck, there was no diminution in the quantity of her milk during the whole time of her fever, nor did her infant suffer the least injury from sucking her breasts.

I observed tears to flow from the eye of a young woman in this fever, at a time when her mind seemed free from distress of any kind.

V. I proceed next to mention the symptoms of this fever in the nervous system.

Delirium was less common than last year. I was much struck in observing John Madge, who had retained his reason while he was so ill as to require three bleedings a day, to become delirious as soon as he began to recover, at which time his pulse rose from between 60 and 70, to 96 strokes in a minute. I saw one case of extreme danger, in which a hysterical laughing and weeping alternately attended.

I have before mentioned the frequency of mania as a symptom of this disease. An obstinate wakefulness attend-

ed the convalescence from this fever in Peter Brown, John Madge, and Mr. Cole.

Fainting was more common in this fever than in the fever of 1793. It ushered in the disease in one of my patients, and it occurred in several instances after bleeding, where the quantity of blood drawn was very moderate.

Several people complained of giddiness in the first attack of the fever, before they were confined to their beds. Sighing was less common, but a hiccup was more so, than in the year before.

John Madge had an immobility in his limbs bordering upon palsy. A weakness in the wrist in one case succeeded a violent attack of the fever.

Peter Brown complained of a most acute pain in the muscles of one of his legs. It afterwards became so much inflamed as to require external applications to prevent the inflammation terminating in an abscess. Mrs. Mitchell complained of severe cramps in her legs.

The sensations of pain in this fever were often expressed in extravagant language. The pain in the head, in a particular manner, was compared to repeated strokes of a hammer upon the brain, and in two cases, in which this pain was accompanied by great heat, it was compared to the boiling of a pot.

The more the pains were confined to the bones and back, the less danger was to be apprehended from the disease. I saw no case of death from the yellow fever in 1793, where the patient complained much of pain in the back. It is easy to conceive how this external determination of morbid action should preserve more vital parts. The bilious fever of 1780 was a harmless disease, only because it spent its whole force chiefly upon the limbs. This was so generally the case, that it acquired, from the pains in the bones which accompanied it, the name of the "break bone fever." Hippocrates has remarked that pains which descend, in a fever, are more favourable than those which ascend.* This is probably true, but I did not observe any such peculiarity in the translation of pain in this fever. The following fact from Dr. Grainger will add weight to the above observations. He observed the pains in a malignant fever which were diffused through the whole

* Epidemics, book ii. sect. 2

head, though excruciating, were much less dangerous than when they were confined to the temples or forehead.*

I saw two cases in which a locked jaw attended. In one of them it occurred only during one paroxysm of the fever. In both it yielded in half an hour to blood-letting. I met with one case in which there was universal tetanus. I should have suspected this to have been the primary disease, had not two persons been infected in the same house with the yellow fever.

The countenance sometimes put on a ghastly appearance in the height of a paroxysm of the fever. The face of a lady, admired when in health for uncommon beauty, was so much distorted by the commotions of her whole system, in a fit of the fever, as to be viewed with horror by all her friends.

VI. The senses and appetites were affected in this fever in the following manner.

A total blindness occurred in two persons during the exacerbation of the fever, and ceased during its remissions. A great intolerance of light occurred in several cases. It was most observable in John Madge during his convalescence.

A soreness in the sense of touch was so exquisite in Mrs. Kapper, about the crisis of her fever, that the pressure of a piece of fine muslin upon her skin gave her pain.

Peter Brown, with great heat in the skin, and a quick pulse, had no thirst; but a most intense degree of thirst was very common in this fever. It produced the same extravagance of expression that I formerly said was produced by pain. One of my patients, Mr. Cole, said he "could drink up the ocean." I did not observe thirst to be connected with any peculiar state of the pulse.

George Eyre and Henry Clymer had an unusual degree of appetite, just before the usual time of the return of a paroxysm of fever.

A young man complained to me of being afflicted with nocturnal emissions of seed during his convalescence. This symptom is not a new one in malignant fevers. Hippocrates takes notice of it.† I met with one instance of it among

* *Historia Febris Anomalæ Batavæ Annorum 1746, 1747, 1748*, cap. i.

† *Epidemics*, book IV.

the sporadic cases of yellow fever which occurred in 1795. It sometimes occurs, according to Lomius, in the commotions of the whole system which take place in epilepsy.

VII. The disease made an impression upon the lymphatic system. Four of my patients had glandular swellings: two of them were in the groin; a third was in the parotid; and the fourth was in the maxillary glands. Two of these swellings suppurated.

VIII. The yellowness of the skin, which sometimes attends this fever, was more universal, but more faint than in the year 1793. It was, in many cases, composed of such a mixture of colours, as to resemble polished mahogany. But, in a few cases, the yellowness was of a deep orange colour. The former went off with the fever; but the latter often continued for several weeks after the patients recovered. In some instances a red colour predominated to such a degree in the face, as to produce an appearance of inflammation.

In Mrs. Vogles a yellowness appeared in her eyes during the paroxysm of her fever, and went off in its remissions.

In James Lefferty the yellowness affected every part of his body, except his hands, which were as pale as in a common fever.

Peter Brown tinged his sheets of a yellow colour, by night sweats, many weeks after his recovery.

There was an exudation from the soles of the feet of Richard Wells's maid, which tinged a towel of a yellow colour.

In my Account of the Yellow Fever of 1793, I ascribed the yellow colour of the skin wholly to a mixture of bile with the blood. I believe that this is the cause of it, in those cases where the colour is deep, and endures for several weeks beyond the crisis of the fever: but where it is transitory, and, above all, where it is local, or appears only for a few hours, during the paroxysm of the fever, it appears probable that it is connected with the mode of aggregation of the blood, and that it is produced wholly by some peculiar action in the blood-vessels. A similar colour takes place from the bite of certain animals, and from contusions of the skin, in neither of which cases has a suspicion been entertained of an absorption or mixture of bile with the blood.

A troublesome itching, with an eruption of red blotches on the skin, attended on the first day of the attack of the fever, in Mrs. Gardiner.

A roughness of the skin, and a disposition in it to peel off, appeared about the crisis of the fever, in Miss Sally Eyre.

That species of eruption, which I have elsewhere compared to moscheto bites, appeared in Mrs. Sellers.

John Ray, a day labourer, to whom I was called in the last stage of the fever, had petechiæ on his breast the day before he died.

The burning heat on the skin, called by the ancients "calor mordens," and from which this fever, in some countries, has derived the name of *causus*, was more common this year than last. It was sometimes local, and sometimes general. I perceived it in an exquisite degree in the cheeks only of Miss Sally Eyre, and over the whole body of John Ray. It had no connection with the rapidity or force of the circulation of the blood in the latter instance, for it was most intense at a time when he had no pulse.

It is remarkable that the heat of the skin has no connection with the state of the pulse. This fact did not escape Dr. Chisholm. He says he found the skin to be warm while the pulse was at 52, and that it was sometimes disagreeably cold when the pulse was as quick as in ordinary fever.*

IX. I have in another place rejected putrefaction from the blood as the cause or effect of this fever. I shall mention the changes which were induced in its appearances when I come to treat of the method of cure.

Having described the symptoms of this fever as they appeared in different parts of the body, I shall now add a few observations upon its type or general character.

I shall begin this part of the history of the fever by remarking, that we had but one reigning disease in town during the autumn and winter; that this was a bilious remitting, or intermitting, and sometimes a yellow fever; and that all the fevers from other remote causes than putrid exhalation, partook more or less of the symptoms of the prevailing epidemic. As well might we distinguish the rain which falls in gentle showers in Great-Britain, from

that which is poured in torrents from the clouds in the West-Indies, by different names and qualities, as impose specific names and characters upon the different states of bilious fever.

The forms in which this fever appeared were as follow.

1. A tertian fever. Several persons died of the third fit of tertians, who were so well as to go abroad on the intermediate day of the fever. It is no new thing for malignant fevers to put on the form of a tertian. Hippocrates long ago remarked, that intermittents sometimes degenerate into malignant acute diseases; and hence he advises physicians to be on their guard upon the 5th, 7th, 9th, and even on the 14th day of such fevers.*

2. It appeared most frequently in the form of a remittent. The exacerbations occurred most commonly in the evening. In some there were exacerbations in the morning as well as in the evening. But I met with several patients who appeared to be better and worse half a dozen times in a day. In each of these cases, there were evident remissions and exacerbations of the fever.

It assumed in several instances, the symptoms of a colic and cholera morbus. In one case the fever, after the colic was cured, ended in a regular intermittent. In another, the colic was accompanied by a hæmorrhage from the nose. I distinguished this bilious colic from that which is excited by lighter causes, by its always coming on with more or less of a chilliness.† The symptoms of colic and cholera morbus occurred most frequently in June and July.

4. It appeared in the form of a dysentery in a boy of William Corfield, and in a man whom my pupil, Mr. Alexander, visited in the neighbourhood of Harrowgate.

5. It appeared, in one case, in the form of an apoplexy.

6. It disguised itself in the form of madness.

7. During the month of November, and in all the winter months, it was accompanied with pains in the sides and breast, constituting what nosologists call the "pleuritis biliosa."

8. The puerperal fever was accompanied, during the summer and autumn, with more violent symptoms than usual. Dr. Physick informed me, that two women, to whom he was called soon after their delivery, died of ute-

* De Morb. Popular. lib. VII.

† See Sydenham, vol. I. 212.

rine hæmorrhages ; and that he had with difficulty recovered two other lying-in women, who were afflicted with that symptom of a malignant diathesis in the blood-vessels.

9. Even dropsies partook more or less of the inflammatory and bilious character of this fever.

10. It blended itself with the scarlatina. The blood, in this disease, and in the puerperal fever, had exactly the same appearance that it had in the yellow fever. A yellowness in the eyes accompanied the latter disease in one case that came under my notice.

A slight shivering ushered in the fever in several instances. But the worst cases I saw came on without a chilly fit, or the least sense of coldness in any part of the body.

Such was the predominance of the intermitting, remitting, and bilious fever, that the measles, the small-pox, and even the gout itself, partook more or less of its character. There were several instances in which the measles, and one in which the gout appeared with quotidian exacerbations ; and two in which madness appeared regularly in the form of a tertian.

I mentioned formerly that this fever sometimes went off with a sweat, when it appeared in a tertian form. This was always the case with the second grade of the fever, but never with the first degree of it, before the third or fourth paroxysm ; nor did a sweat occur on the fifth or seventh day, except after the use of depleting remedies. This peculiarity in the fever of this year was so fixed, that it gave occasion for my comparing it, in my intercourse with my patients, to a lion on the first seven days, and to a lamb during the remaining part of its duration.

The fever differed from the fever of the preceding year in an important particular. I saw or heard of no case which terminated in death on the first or third day. In every case, the fever came on fraught with paroxysms. The moderate degrees of it were of so chronic a nature as to continue for several weeks, when left to themselves. I wish this peculiarity in the epidemic which I am now describing to be remembered ; for it will serve hereafter to explain the reason why a treatment apparently different should be alike successful, in different seasons and in different countries.

The crisis of the fever occurred on uneven days more frequently than in the fever of the year 1793.

I remarked formerly* that remissions were more common in the yellow fever than in the common bilious fever. The same observation applies to critical days. They were observable in almost every case in which the disease was not strangled in its birth. Dr. Chisholm describes the same peculiarity in the Buellam fever. "I have not met with any disease (says the doctor) in which the periods were more accurately ascertained."†

In addition to the instances formerly enumerated,‡ of the predominance of powerful epidemics over other diseases, I shall add two more, which I have lately met with in the course of my reading.

Dr. Chisholm, in describing the pestilential fever introduced into the West-Indies from Buellam, has the following remarks. "Most other diseases degenerated into, or partook very much of this. Dysenteries suddenly stopped, and were immediately succeeded by the symptoms of the pestilential fever. Catarrhal complaints, simple at first, soon changed their nature; convalescents from other diseases were very subject to this, but it generally proved mild. Those labouring at the same time under chronic complaints, particularly rheumatism and hepatitis, were very subject to it. The puerperal fever became malignant, and of course fatal; and even pregnant negro women, who otherwise might have had it in the usual mild degree peculiar to that description of people, were reduced to a very dangerous situation by it. In short, every disease in which the patient was liable to infection, sooner or later assumed the appearance, and acquired the danger of the pestilential fever."§

Dr. Desportes ascribes the same universal empire to the yellow fever which prevailed in St. Domingo, in the summer of 1733. "The fever of Siam (says the doctor) conveyed an infinite number of men to the grave, in a short time; but I saw but one woman who was attacked by it." "The violence of this disease was such; that it subjected all other diseases, and reigned alone. This is the character of all contagious and pestilential diseases. Sydenham, and before him Diemerbroek, have remarked this of the plague."||

* Account of the Yellow Fever of 1793.

† Page 141.

‡ Account of the Yellow Fever in 1793.

§ Page 129, 130.

|| Page 40, 41. See also p. 111, 230, 231 vol. I

In Baltimore the small-pox in the natural way was attended with unusual malignity and mortality, occasioned by its being combined with the reigning yellow fever.

It has been urged as an objection to the influence of powerful epidemics chasing away, or bleeding with fevers of inferior force, that the measles sometimes supplant the small-pox, and mild intermittents take the place of fevers of great malignity. This fact did not escape the microscopic eye of Dr. Sydenham, nor is it difficult to explain the cause of it. It is well known that epidemics, like simple fevers, are most violent at their first appearance, and that they gradually lose their force as they disappear; now it is in their evanescent and feeble state, that they are jostled out of their order of danger or force, and yield to the youthful strength of epidemics, more feeble under equal circumstances of age than themselves. But admitting, powerful epidemics do not lose any part of their force by their duration, the system from habit, loses its susceptibility to their action to such a degree, as to yield to the *new* impressions of such as are of a more feeble nature. From this change in the character of violent epidemics, they have been said to invade with the fury of a savage, and to retire with the gentleness of a civilized foe.

It is agreeable to discover from these facts and observations, that epidemic diseases, however irregular they appear at a first sight, are all subject to certain laws, and partake of the order and harmony of the universe.

The action of the miasmata upon the body, when from the absence of an exciting cause, they did not produce fever, was the same as I have elsewhere described. The sensations which I experienced, in entering a small room where a person was confined with this fever, were so exactly the same with those I felt the year before, that I think I could have distinguished the presence of the disease without the assistance of my eyes, or without asking a single question. After sitting a few minutes in a sick room, I became languid and fainty. Weakness and chilliness followed every visit I paid to a gentleman at Mr. Oeller's hotel, which continued for half an hour. A burning in my stomach, great heaviness, and a slight inflammation in my eyes, with a constant discharge of a watery humour from them for two days, succeeded the first visit I paid to Mrs.

Sellers. These symptoms came on in less than ten minutes after I left her room. They were probably excited thus early, and in the degree which I have mentioned, by my having received her breath in my face by inspecting her tonsils, which were ulcerated on the first attack of the fever. I formerly supposed these changes in my body were proofs of the contagious nature of the yellow fever, but I shall hereafter explain them upon other principles.

I recollect having more than once perceived a smell which had been familiar to me during the prevalence of the yellow fever in 1793. It resembled the smell of liver of sulphur. I suspected for a while that it arose from the exhalations of the gutters of the city. But an accident taught me that it was produced by the perspiration of my body. Upon rubbing my hands, this odour was increased so as to become not only more perceptible to myself, but in the most sensible degree to my pupil, Mr. Otto. From this fact, I was convinced that I was strongly impregnated with miasmata, and I was led by it to live chiefly upon vegetables, to drink no wine, and to avoid, with double care, all the usual exciting causes of fever.

There was another mark by which I distinguished the presence of the seeds of this fever in my system, and that was, wine imparted a burning sensation to my tongue and throat, such as is felt after it has been taken in excess, or in the beginning of a fever. Several persons, who were exposed to the miasmata, informed me that wine, even in the smallest quantity, affected them exactly in the same manner.

I attended four persons in this fever who had had it the year before.

It remains now that I mention the origin of this fever. This was very evident. It was produced by the exhalations from the gutters, and the stagnating ponds of water in the neighbourhood of the city. Where there was most exhalation, there were most persons affected by the fever. Hence the poor people, who generally live in the neighbourhood of the ponds in the suburbs, were the greatest sufferers by it. Four persons had the fever in Spruce, between Fourth and Fifth-streets, in which part of the city the smell from the gutters was extremely offensive every evening. In Water-street, between Market and Walnut-streets, ma-

ny persons had the fever : now the filth of that confined part of the city is well known to every citizen.

I have before remarked, that one reason why most of our physicians refused to admit the presence of the yellow fever in the city, was because they could not fix upon a vestige of its being imported. On the 25th of August, the brig Commerce arrived in the river, from St. Mark, commanded by captain Shirtliff. After lying five days at the fort, she came up to the city. A boy, who had been shut out from his lodgings, went, in a state of intoxication, and slept on her deck, exposed to the night air, in consequence of which the fever was excited in him. This event gave occasion, for a few days, to a report that the disease was imported, and several of the physicians, who had neglected to attend to all the circumstances that have been stated, admitted the yellow fever to be in town. An investigation of this supposed origin of the disease soon discovered that it had no foundation. At the time of the arrival of this ship, I had attended nearly thirty persons with the fever, and upwards of a hundred had had it, under the care of other physicians.

The generation of the yellow fever in our city was rendered more certain by the prevalence of bilious diseases in every part of the United States, and, in several of them, in the grade of yellow fever. It was common in Charleston, in South-Carolina, where it carried off many people, and where no suspicion was entertained of its being of West-India origin. It prevailed with great mortality at that part of the city of Baltimore, which is known by the name of Fell's Point, where, Dr. Drysdale assures me, it was evidently generated. A few sporadic cases of it occurred in New-York, which were produced by the morbid exhalation from the docks of that city. Sporadic cases of it occurred likewise in most of the states, in which the proofs of its being generated were obvious to common observation; and where the symptoms of depressed pulse, yellowness of the skin, and black discharges from the bowels and stomach (symptoms which mark the highest grade of bilious remitting fever) did not occur, the fevers in all their form of tertian, quotidian, colic, and dysentery, were uncommonly obstinate or fatal in every state in the Union. In New-Haven only, where the yellow fever was epidemic, it

was said to have been imported from Martinique, but this opinion was proved to be erroneous by unanswerable documents, published afterwards in the Medical Repository, by Dr. Elisha Smith, of New York.

The year 1795 furnished several melancholy proofs of the American origin of the yellow fever. All the physicians and citizens of New-York and Norfolk agree in its having been generated in their respective cities that year. It prevailed with great mortality at the same time in the neighbourhood of the lakes, and on the waters of the Genesee river, in the state of New-York. From its situation it obtained the name of the lake and Genesee fever. It was so general, in some parts of that new country, as to affect horses.

Thus have I endeavoured to fix the predisposing and remote causes of the yellow fever in our country. The remote cause is sometimes so powerful as to become an exciting cause of the disease, but in general both the predisposing and remote causes are harmless in the system, until they be roused into action by some exciting cause.

I shall conclude this account of the symptoms and origin of the yellow fever, by relating two facts, which serious and contemplating minds will apply to a more interesting subject.

1. Notwithstanding the numerous proofs of the prevalence of the yellow fever in Philadelphia in the year 1794, which have been mentioned, there are many thousands of our citizens, and a majority of our physicians, who do not believe that a case of it existed at that time in the city; nor is a single record of it to be met with in any of the newspapers, or other public documents of that fever. Let us learn from this fact, that the denial of events, or a general silence upon the subject of them, is no refutation of their truth, where they opposed the pride or interests of the learned, or the great.

2. Notwithstanding the general denial of the existence of the yellow fever in Philadelphia, and the silence observed by our newspapers relative to it in 1794, there was scarcely a citizen or physician who, three years afterwards, did not admit of its having prevailed in that year. We learn from this fact another important truth, that departed vice and error have no friends nor advocates.

OF THE METHOD OF CURE.

THE remedies employed for the cure of this fever were the same that I employed the year before. I shall only relate such effects of them as tend more fully to establish the practice adopted in the year 1793, and such as escaped my notice in my former remarks upon those remedies. My method of cure consisted,

I. In the abstraction of the stimulus of blood and heat from the whole body, and of bile and other aerid humours from the bowels, by means of the following remedies :

1. Bleeding.
2. Purging.
3. Cool air and cold drinks.
4. Cold water applied to the external parts of the body and to the bowels by means of clysters.

II. In creating a diversion of congestion, inflammation, and serous effusion, from the brain and viscera to the mouth by means of a salivation, and to the external parts of the body by means of blisters.

III. In restoring the strength of the system, by tonic remedies.

I proceed to make a few remarks upon the remedies set down under each of the above heads.

I. I have taken notice that this fever differed from the fever of 1793, in coming forward in July and August with a number of paroxysms, which refused to yield to purging alone. I therefore began the cure of every case I was called to by *bleeding*.

I shall mention the effects of this remedy, and the circumstances, manner, and degrees in which I used it occasionally, in this fever, in my defence of Blood-letting. Under the present head I shall only furnish the reader with a table of the quantity of blood drawn from a number of my patients in the course of the disease. From several of them the quantity set down was taken in three, four, and five days. I shall afterwards describe the appearances of the blood.

Month.	Patients.	Quantity ounces.	Number of times bled.
August.	Peter Denham,	50	5
	Mrs. Bruce,	70	8
	Andrew Gribble, aged 15 years,	50	5
	John Madge,	150	12
	Peter Brown,	80	8
September.	Mrs. Gardiner,	80	7
	Miss Sally Eyre,	80	9
	Mrs. Gass,	50	3
	Richard Wells's maid,	100	10
	Mr. Norval,	100	9
	Mr. Harrison,	90	9
	Henry Clymer,	80	8
	Mrs. Mitchell,	120	13
October.	Mrs. Lenox,	80	7
	Mrs. Kapper,	140	11
	Rev. Dr. Magaw's maid,	100	10
	Miss Hood,	100	10
	Mrs. Vogles,	70	5
	Guy Stone,	100	9
	Benj. Hancock,	100	10
	Mr. Benton,	130	13
1795 January.	Mrs. Fries,	150	15
	Mrs. Garrigues,	80	7

Three of the women, whose names I have mentioned, were in the advanced stage of pregnancy, viz. Mrs. Gardiner, Mrs. Gass, and Mrs. Garrigues. They have all since borne healthy children. I have omitted the names of above one hundred persons who had the fever, from whom I drew thirty or forty ounces of blood, by two or three bleedings. I did not cure a single person without at least one bleeding.

It is only by contemplating the extent in which it is necessary to use this remedy, in order to overcome a yellow fever, that we can acquire just ideas of its force. Hitherto this force has been estimated by no other measure than the

grave, and this, we know, puts the strength of discases upon a level.

The blood drawn in this fever exhibited the following appearances.

1. It was dissolved in a few instances.

2. The crassamentum of the blood was so partially dissolved in the serum, as to produce an appearance in the serum resembling the washings of flesh in water.

3. The serum was so lightly tinged of a *red* colour as to be perfectly transparent.

4. The serum was, in many cases, of a deep yellow colour.

5. There was, in every case in which the blood was not dissolved, or in which the second appearance that has been mentioned did not take place, a beautiful scarlet-coloured sediment in the bottom of the bowl, forming lines, or a large circle. It seemed to be a tendency of the blood to dissolution. This state of the blood occurred in almost all the diseases of the two last years, and in some in which there was not the least suspicion of the miasmata of the yellow fever.

6. The crassamentum generally floated in the serum, but it sometimes sunk to the bottom of the bowl. In the latter case the serum had a muddy appearance.

7. I saw but one case in which there was not a separation of the crassamentum and serum of the blood. Its colour in this case was of a deep scarlet. In the year 1793 this appearance was very common.

8. I saw one case in which the blood drawn, amounting to 14 ounces, separated partially, and was of a deep *black* colour. This blood was taken from Mr. Norval, a citizen of North-Carolina.

9. There was, in several instances, a transparent jelly-like pelicle which covered the crassamentum of the blood, and which was easily separated from it without altering its texture. It appeared to have no connexion with the blood.

10. The blood, towards the crisis of the fever in many people, exhibited the usual forms of inflammatory crust. It was cupped in many instances.

11. After the loss of 70 or 80 ounces of blood there was an evident disproportion of the quantity of crassamentum

to the serum. It was sometimes less, by one half, than in the first bleedings.

Under this head it will be proper to mention that the blood, when it happened to flow along the external part of the arm in falling into the bowl, was so warm as to excite an unpleasant sensation of heat in several patients.

To the appearances exhibited by the blood to the eye, I shall add a fact communicated to me by a German bleeder, who followed his business in the city during the prevalence of the fever in 1793. He informed me that he could distinguish a yellow fever from all other states of fever, by a peculiar smell which the blood emitted while it was flowing from a vein. From the certainty of his decision in one case which came under my notice, before a suspicion had taken place of the fever being in the city, I am disposed to believe that there is a foundation for his remark.

II. I have but little to add to the remarks I made upon the use of *purging* in the year 1793. I gave jalap, calomel, and gamboge, until I obtained large and dark-coloured stools; after which I kept the bowels gently open every day with castor oil, cremor tartar, or Glauber's salts. I gave calomel in much larger quantities than I did the year before. John Madge took nearly 150 grains of it in six days. I should have thought this a large quantity, had I not since read that Dr. Chisholm gave 400 grains of it to one patient in the course of his fever, and 50 grains to another at a single dose, three times a day. I found strong mercurial purges to be extremely useful in the winter months, when the fever put on symptoms of pleurisy. I am not singular in ascribing much to the efficacy of purges in the bilious pleurisy. Dr. Desportes tells us that he found the pleurisy of St. Domingo, which was of a bilious kind, to end happily in proportion as the bowels were kept constantly open.* Nor am I singular in keeping my eye upon the original type of a disease, which only changes its symptoms with the weather or the season, and in treating it with the same remedies. Dr. Sydenham bled as freely in the diarrhœa of 1688, as he had done in the inflammatory fever of the preceding year.† How long the pleurisies of winter, in the city of Philadelphia, may continue to retain the bilious symptoms

* Page 140

† Wallis's edition, p 211. vol. i.

of autumn, which they have assumed for three years past, I know not ; but the late Dr. Faysseaux, of South-Carolina, informed me, that for many years he had not seen a pleurisy in Charleston with the common inflammatory symptoms which characterised that disease when he was a student of medicine. They all now put on bilious symptoms, and require strong purges to cure them. The pleurisies which the late Dr. Chalmers supposes he cured by purging were probably nothing but bilious fevers, in which the cool weather had excited some pleuritic symptoms.

3. I have nothing to add to the remarks I have elsewhere published upon the efficacy of *cool air* and *cool drinks* in this fever. They were both equally pleasant and useful, and contributed, with cleanliness, very much to the success of my practice.

4. *Cold water*, applied to the external parts of the body, and injected into the bowels by way of clyster, did great service in many cases. John Madge found great relief from clothes dipped in cold water, and applied to the lower part of his belly. They eased a pain in his bowels, and procured a discharge of urine. A throbbing and most distressing pain in the head was relieved by the same remedy, in Mrs. Vogles and Mrs. Lenox. The cloths were applied for three successive days and nights to Mrs. Lenox's head, during an inflammation of her brain, which succeeded her fever, and were changed, during the greater part of the time, every ten or fifteen minutes. In 1795, I increased the coldness of pump water, when used in this way, by dissolving ice in it, and in some cases I applied powdered ice in a bladder to the head, with great advantage.

The following facts will show the good effects of cold water in this, as well as other fevers of too much action.

In the afternoon of one of those days in which my system was impregnated with the miasmata of the yellow fever, I felt so much indisposed that I deliberated whether I should go to bed or visit a patient about a mile in the country. The afternoon was cool and rainy. I recollected, at this time, a case related by Dr. Daignan, a French physician, of a man who was cured of the plague, by being forced to lie all night in an open field, in a shower of rain. I got into my chair, and exposed myself to the rain. It was extremely grateful to my feelings. In two hours I

returned, when, to my great satisfaction, I found all my feverish symptoms had left me, nor had I the least return of them afterwards.

Dr. Caldwell, who acted as a surgeon of a regiment, in the expedition against the insurgents in the western counties of Pennsylvania, furnished me, in a letter dated from Bedford, October 20th, 1794, with an account of his having been cured of a fever, by a more copious use of the same remedy. "I was (says the doctor) to use a vulgar expression, *wet to the skin*, and had no opportunity of shifting my clothes for several hours. In consequence of this thorough bathing, and by subsequent exposure to a cool air, I was relieved from every symptom of indisposition in a few hours, and have enjoyed more than my usual stock of health ever since."

The efficacy of cold water, in preventing and curing inflammation, may be conceived from its effects when used with mud or clay, for obviating the pain and inflammation which arise from the sting of venomous insects. The same remedy, applied for half an hour, has lately, it is said, been equally effectual in preventing the deleterious effects of the bite of a rattle-snake.

II. The good effects I had observed from the *salivation* in the yellow fever of 1793, induced me to excite it as early as possible, in all those cases which did not yield immediately to bleeding and purging. I was delighted with its effects in every case in which it took place. These effects were as follow :

1. It immediately attracted and concentrated in the mouth all the scattered pains of every part of the body.
2. It checked a nausea and vomiting.
3. It gradually, when it was copious, reduced the pulse, and thereby prevented the necessity of further bleeding or purging.

I wish it were possible to render the use of this remedy universal in the treatment of malignant fevers. Dr. Chisholm, in his account of the Beullam fever, has done much to establish its safety and efficacy. It is a rare occurrence for a patient that has been sufficiently bled and purged, to die after a salivation takes place. The artificial disease excited by the mercury suspends or destroys disease in every part of the body. The occasional inconveniences which

attend it are not to be named with its certain and universal advantages. During the whole of the season in which the yellow fever prevailed, I saw but two instances in which it probably loosened or destroyed the teeth. I am not certain that the mercury was the cause of the injury or loss of those teeth: for who has not seen malignant fevers terminate in ulcers, which have ended in the erosions of bony parts of the body?

It has been justly remarked, that there can be but one action at a time in the blood-vessels. This was frequently illustrated by the manner in which mercury acted upon the system in this fever. It seldom salivated until the fever intermitted or declined. I saw several cases in which the salivation came on during the intermission, and went off during its exacerbation; and many, in which there was no salivation until the morbid action had ceased altogether in the blood-vessels, by the solution of the fever. It is because the action of the vessels, in epilepsy and pulmonary consumption, surpasses the stimulus of the mercury, that it is so difficult to excite a salivation in both those diseases.

Let not the advocates for the healing powers of nature complain of a salivation as an unnatural remedy in fevers. Dr. Sydenham speaks in high terms of it, in the fever of 1670, 1671, and 1672, in which cases it occurred spontaneously, and says that it cured it when it was so malignant as to be accompanied by purple spots on the body.*

Blisters, when applied at a *proper* time, did great service in this fever. This time was, when the fever was so much weakened by evacuations, that the artificial pain excited by the stimulus of the blisters destroyed, and, like a conductor, conveyed off all the natural pain of the body. It is from ignorance, or inattention to the proper stage of fevers in which blisters have been applied, that there have been so many disputes among physicians respecting their efficacy. When applied in a state of great arterial action, they do harm; when applied after that action has nearly ceased, they do little or no service. I have called the period in which blisters are useful the *blistering point*. In bilious fevers this point is generally circumscribed within eight and forty hours.

The effects of blisters were as follow :

* Vol. ii. p. 212.

1. They concentrated, like a salivation, all the scattered pains of the body, and thereby,
2. Reduced the pulse in force and frequency.
3. They instantly checked a sickness at the stomach and vomiting.
4. They often induced a gentle moisture upon the skin.

I found it of little consequence to what part of the body the blisters were applied; for I observed a pain in the head, and even delirium, to be as speedily and certainly cured by blisters upon the wrists, as they were by a large blister to the neck.

III. After the reduction of the morbid action of the blood-vessels, by means of the remedies which have been mentioned, I seldom made use of any other tonic than a nourishing and gently stimulating diet. This consisted of summer fruits, bread and milk, chicken broth; the white meats, eggs, oysters, and malt liquors, more especially porter. I made many attempts to cure this fever when it appeared in the form of a simple intermittent, without malignant symptoms, by means of *bark*, but always, except in two instances, without success; and in them it did not take effect until after bleeding. In several cases it evidently did harm. I should have suspected my judgment in these observations respecting this medicine, had I not been assured by Dr. Griffiths, Dr. Physick, and Dr. Woodhouse, that it was equally ineffectual in their practice, in nearly all the cases in which they gave it, and even where blood-letting had been premised. Dr. Woodhouse saw a case in which nearly a pound of bark had been taken without effect; and another in which a fatal dropsy succeeded its use. Dr. Griffiths excepted, from his testimony against the bark, the cases of seven persons from the country, who brought the seeds of the intermitting fever with them to the city. In them the bark succeeded without previous bleeding. The facility with which these seven cases of intermitting fever were cured by the bark, clearly proves that fevers of the same season differ very much, according to the nature of the exhalation which excites them. The intermittents in these strangers were excited by miasmata of less force than that which was generated in our city, in which, from the greater heat of the atmosphere, and the more heterogeneous nature of the putrid matters which stagnate in our

ponds and gutters, the exhalation probably possesses a more active and stimulating quality. Thus the mild remittents in June, and in the beginning of July, which were produced by the usual filth of the streets of Philadelphia, in the year 1793, differed very much from the malignant remitting yellow fever which was produced by the stench of the putrid coffee a few weeks afterwards.

Sir John Pringle long ago taught the inefficacy of bark in certain bilious fevers. But Dr. Chisholm has done great service to medicine by recording its ill effects in the Beulam fever. "Head-ach (says the doctor,) a heavy dull eye, with a considerable protrusion from its orbits, low spirits, thirst, and a total want of appetite, were the general consequences of the treatment with bark without the previous antiphlogistic."

I have mentioned a case of internal dropsy of the brain having been produced by the improper use of the bark, in a son of Mr. Coates. I have no doubt but this disease, as also palsy and consumption, obstructions of the liver and bowels, and dropsies of the belly and limbs, are often induced by the use of the bark, during an inflammatory state of the blood-vessels. It is to be lamented that the association of certain diseases and remedies, in the minds of physicians, becomes so fixed, as to refuse to yield to the influence of reason. Thus pain and opium, dropsy and foxglove, low spirits and assafoetida, and above all, an intermitting fever and bark, are all connected together, in common practice, as mechanically as the candle and the snuffers are in the mind of an old and steady house servant. To abolish the mischief of these mechanical associations in medicine, it will be necessary for physicians to prescribe only for the different states of the system.

Finding the bark to be so universally ineffectual or hurtful, I substituted columbo root, the caribbean bark, and several other bitters, in its place, but without success. They did less harm than the jesuit's bark, but they did not check the return of a single paroxysm of fever.

I know that bark was given in this fever in some instances in which the patients recovered; but they were subject, during the winter, and in the following spring, to frequent relapses, and in some instances, to affections of the brain and lungs. In the highest grade of the fever it certainly

accelerated a supposed putrefaction of the blood, and precipitated death. The practice of physicians who create this gangrenous state of fever by means of the bark, resembles the conduct of a horse, who attempts by pawing to remove his shadow in a stream of water, and thereby renders it so turbid that he is unable to drink it.

Should the immediate success of tonic and depleting medicines in destroying the fever be equal, the effects of the former upon the constitution cannot fail of being less safe than the latter remedies. They cure by overstraining the powers of life. There is the same difference, therefore, between the two modes of practice, that there is between gently lifting the latch of a door, and breaking it open, in order to go into a house.

Wine was hurtful in every case of yellow fever in which it was given, while there were any remains of inflammatory action in the system. I recollect that a few spoonfuls of it, which Mr. Harrison of Virginia took in the depressed state of his pulse, excited a sensation in his stomach which he compared to a fire. Even wine-whey, in the excitable state of the system induced by this fever, was sometimes hurtful. In a patient of Dr. Physick, who was on the recovery, it produced a relapse that had nearly proved fatal, in the year 1795. Dr. Desperrieres ascribes the death of a patient to a small quantity of wine given to him by a black nurse.* These facts are important, inasmuch as wine is a medicine which patients are most apt to use in all cases, without the advice of a physician.

I observed *opium* to be less hurtful in this fever than it was in the fever of 1793. I administered a few drops of laudanum, in one case, in the form of a clyster, in a violent pain in the bowels, with evident advantage, before the inflammatory action of the blood-vessels was subdued. In this way I have often obtained the composing effects of laudanum where it has been rejected by the stomach. But I gave it sparingly, and in small doses only, in the early stage of the fever. John Madge, whose pains in his bowels were often as exquisite as they are in the most acute colic, did not take a single drop of it. I used no anodyne in his case but bleeding, and applications of cold water to the inside and outside of his bowels. After the fever had passed

* Vol. ii. p. 103.

the seventh day, and had been so far subdued by copious evacuations as to put on the form of a common inflammatory intermittent, I gave laudanum during the intermissions of the fever with great advantage. In some cases it suddenly checked the paroxysms of the fever, while in many more it only moderated them, but in such a manner that they wore themselves away in eight or ten days. One of my female patients, who had taken bitters of every kind without effect to cure a tertian, which succeeded a yellow fever, took a large dose of laudanum, in the interval of her paroxysms, to cure a tooth-ach. To her great surprise it removed her tertian. The effects of laudanum in this fever were very different from those of bark. Where it did no service it did not, like the bark, do any harm.

Perhaps this difference in the operation of those two medicines depended upon the bark acting with an astringent, as well as stimulating power, chiefly upon the blood-vessels, while the action of opium was more simply stimulating, and diffused at the same time over all the systems of the body.

I shall say in another place that I sometimes directed a few drops of laudanum to be given in that state of extreme debility which succeeds a paroxysm of the fever, with evident advantage.

Nitre, so useful in common inflammatory fevers, was in most cases so offensive to the stomach in this fever, that I was seldom able to give it. Where the stomach retained it I did not perceive it to do any service.

Antimonials were as ineffectual as nitre in abating the action of the sanguiferous system, and in producing a sweat. I should as soon expect to compose a storm by music, as to cure the yellow fever by such feeble remedies.

Thus have I finished the history of the symptoms, origin, and cure of the yellow fever as it appeared in Philadelphia in 1794, and in the winter of 1795. The efficacy of the remedies which have been mentioned was established by almost universal success. Out of upwards of 200 patients to whom I was called on the first stage of the fever, between the 12th of June, 1794, and the first of April, 1795, I lost but four persons, in whom the unequivocal symptoms had occurred, which characterize the first grade of the disease.

It will be useful, I hope, to relate the cases of the patients whom I lost, and to mention the causes of their deaths. The first of them was Mrs. Gavin. She objected to a fifth bleeding in the paroxysm of her fever, and died from the want of it. Her death was ascribed to the frequency of her bleedings by the enemies of the depleting system. It was said that she had been bled ten times, owing to ten marks of a lancet having been discovered on her arms after death, five of which were occasioned by unsuccessful attempts to bleed her. She died with the usual symptoms of congestion in her brain.

Mr. Marr, to whom I was called on the first day of his disease, died in a paroxysm of his fever which came on in the middle of the seventh night after six bleedings. I had left him, the night before, nearly free of fever, and in good spirits. He might probably have been saved (humanly speaking) by one more bleeding in the exacerbation of what appeared to be the critical paroxysm of his fever.

Mr. Montford of the state of Georgia, died under the joint care of Dr. Physick and myself. He had been cured by plentiful bleeding and purging, but had relapsed. He appeared to expire in a fainty fit, in the first stage of a paroxysm of the fever. Death from this cause (which occurs most frequently where blood-letting is not used) is common in the yellow fever of the West-Indies. Dr. Bisset, in describing the different ways in which the disease terminates fatally, says, "In a few cases the patient is carried off by an *unexpected syncope*."*

A servant of Mr. Henry Mitchel, to whom I was called in the early stage of his disease, died in consequence of a sudden effusion in the lungs, which had been weakened by a previous pulmonary complaint.

I wish the friends of bark and wine in the yellow fever, or of *moderate* bleeding with antimonial medicines, would publish an account of the number of their deaths by the fever, within the period I have mentioned, and with the same fidelity I have done. The contrast would for ever decide the controversy in favour of copious depletion. The mortality under the tonic mode of practice may easily be conceived from the acknowledgment of one of the gentlemen who used it, but who premised it, in many cases,

* Medical Essays and Observations, p. 28.

by two or three bleedings. He informed Dr. Woodhouse, that out of twenty-seven patients, whom he had attended in the yellow fever, he had saved but nine. Other practitioners were I believe, equally unsuccessful, in proportion to the number of patients whom they attended. The reader will not admit of many deaths having occurred from the diseases (formerly enumerated) to which they were ascribed, when he recollects that even a single death from most of them, in common seasons, is a rare occurrence in the practice of regular bred physicians.

In answer to the account I have given of the mortality of the fever of 1794, it will be said, that 30 persons died less in that year, than in the healthy year of 1792. To account for this, it will be necessary to recollect that the inhabitants of Philadelphia were reduced in number upwards of 4000, in the year 1793, and of course that the proportion of deaths was greater in 1794 than it was in 1792, although the number was less. It is remarkable that the burials in the strangers' grave-yard amounted in the year 1792 to but 201, whereas in 1794 they were 676. From this it appears, that the deaths must have been very numerous among new comers (as they are sometimes called) in the year 1794, compared with common years. Now this will easily be accounted for, when we recollect that these people, who were chiefly labourers, were exposed to the constantly exciting causes of the disease, and that, in all countries, they are the principal sufferers by it.

But in order to do justice to this comparative view of the mortality induced by the yellow fever in the year 1794, it will be necessary to examine the bill of mortality of the succeeding year. By this it appears that 2274 persons died in 1795, making 1139 more than died in 1794. The greatness of this mortality, I well recollect, surprised many of the citizens of Philadelphia, who had just passed an autumn which was not unusually sickly, and who had forgotten the uncommon mortality of the months of January, February, and March, which succeeded the autumn of 1794.

It will probably be asked, how it came to pass that I attended so many more patients in this fever than any of my brethren. To this I answer, that, since the year 1793, a great proportion of my patients have consisted of strangers, and of the poor; and as they are more exposed to the

disease than other people, it follows, that of the persons affected by the fever, a greater proportion must have fallen to my share as patients, than to other physicians. My ability to attend a greater number of patients than most of my brethren, was facilitated by my having at the time of the fever, several ingenuous and active pupils, who assisted me in visiting and prescribing for the sick. These pupils were, Ashton Alexander and Nathaniel Potter (now physicians at Baltimore,) John Otto (now physician in Philadelphia,) and Gilbert Watson (since dead of the yellow fever.)

The antiphlogistic remedies were not successful in Philadelphia, in the yellow fever, in my hands alone. They were equally, and perhaps more so, in the hands of my friends Dr. Griffiths, Dr. Physick, Dr. Dewees, and Dr. Woodhouse.

They were moreover successful at the same time in New-Haven, Baltimore, and in Charleston, in South-Carolina. Eighteen out of twenty died of all who took bark and wine in New-Haven, but only one in ten of those who used the depleting medicines. In a letter from Dr. Brown, a physician of eminence in Baltimore, dated November 27th, 1794, he says, "of the many cases which fell to my care, two only proved mortal where I was called on the first day of the disease, and had an uncontrolled opportunity to follow my judgment. Where salivation took place, I had no case of mortality; and in two of those cases a black vomiting occurred." Dr. Ramsay, of Charleston, in a letter to one of his friends in this city, dated October 14th, 1794, subscribes to the efficacy of the same practice in a fever which prevailed at that time in Charleston, and which, he says, resembled the yellow fever of Philadelphia in the year 1793.

But the success of the depleting system was not confined to the United States. In a letter before quoted, which I received from Dr. Davidson; of St. Vincents, dated July 22d, 1794, there is the following testimony in favour of evacuations from the blood-vessels, bowels, and salivary glands :

"Where the fever comes on with great determination to the head, and an affection of the stomach, in consequence of that determination, violent head-ach, redness of the eyes, turgescence of the face, impatience of light, &c. attended

with a full and hard pulse, *blood-letting* should be employed *freely* and *repeatedly*, cold applications should be applied to the head, and purging medicines should be employed. As a purge, *calomel* has been used with the greatest advantage, sometimes by itself, but most frequently combined with some active purgative medicine, such as jalap. From some peculiarity in the disease, an uncommon quantity of the calomel is necessary to affect the bowels and salivary glands. As I found a small quantity of it did not produce the effect I wished for promptly, I have gradually increased the quantity, until I now venture to give *ten* grains of it, combined with five of jalap, every *two* hours until stools are procured. The calomel is then given by itself.

“The patients have generally an aversion to wine. The bark is seldom found of much advantage in this state of the fever, and frequently brought on a return of the vomiting. I preferred to it, in a remission of the symptoms, a vinous infusion of the quassia, which sat better upon the stomach.”

In the island of Jamaica, the depleting system has been divided. It appears from several publications in the Kingston papers, that Dr. Grant had adopted blood-letting, while most of the physicians of the island rest the cure of the yellow fever upon strong mercurial purges. The ill effects of *moderate* bleeding probably threw the lancet into disrepute, for the balance of success, from those publications, is evidently in favour of simple purging. I have no doubt of the truth of the above statement of the controversy between the exclusive advocates for bleeding and purging; or perhaps the superior efficacy of the latter remedy may be explained in the following manner.

In warm climates, the yellow fever is generally, as it was in Philadelphia in the month of August and in the beginning of September, 1793, a disease of but two or three paroxysms. It is sometimes, I believe, only a simple *ephemera*. In these cases, purging alone is sufficient to reduce the system, without the aid of bleeding. It was found to be so until the beginning of September, in 1793, in most cases in Philadelphia. The great prostration of the system in the yellow fever, in warm weather and in hot climates, renders the restoration of it to a healthy state of action more gradual, and of course more safe, by means of

purging than bleeding. The latter remedy does harm, from the system being below the point of re-action, after the pressure of the blood is taken from it, or by restoring the blood-vessels too suddenly to preternatural action, without reducing them afterwards. Had bleeding been practised agreeably to the method described by Riverrius (mentioned in the history of the fever of 1793), or had the fever in Jamaica run on to more than four or five paroxysms, it is probable the loss of blood would have been not only safe, but generally beneficial. I have, in the same history, given my reasons why *moderate* bleeding in this, as well as many other diseases, does harm. In those cases where it has occurred in large quantities from natural hæmorrhages, it has always done service in the West-Indies. The inefficacy, and, in some cases, the evils, of *moderate* blood-letting are not confined to the yellow fever. It is equally ineffectual, and, in some instances, equally hurtful, in apoplexy, internal dropsy of the brain, pleurisy, and pulmonary consumption. Where all the different states of the pulse which indicate the loss of blood are perfectly understood, and blood-letting conformed in *time* and in *quantity* to them, it never can do harm, in any disease. It is only when it is prescribed empirically, without the direction of just principles, that it has ever proved hurtful. Thus the fertilizing vapours of heaven, when they fall only in dew, or in profuse showers of rain, are either insufficient to promote vegetation, or altogether destructive to it.

There may be habits in which great and long protracted debility may have so far exhausted the active powers of the system, as to render bleeding altogether improper in this disease, in a West-India climate. Such habits are sometimes produced in soldiers and sailors, by the hardships of a military and naval life. Bleeding in such cases, Dr. Davidson assures me in a letter, dated from Martinique, February 29th, 1796, did no good. The cure was effected, under these circumstances, by purges, and large doses of calomel. But where this chronic debility does not occur, bleeding, when properly used, can never be injurious, even in a tropical climate, in the yellow fever. Of this there are many proofs in the writings of the most respectable English and French physicians. In spite of the fears and

clamours which have been lately excited against it in Jamaica, my late friend and contemporary at the college of Edinburgh, Dr. Broadbelt, in a letter from Spanish Town, dated January 6th, 1795, and my former pupil, Dr. Weston, in a letter from St. Ann's Bay, dated June 17th, 1795, both assure me, that they have used it in this fever with great success. Dr. Weston says that he bled "*copiously* three times in twenty-four hours, and thereby saved his patient."

The superior advantages of the North American mode of treating the yellow fever, by means of *all* the common antiphlogistic remedies, will appear from comparing its success with that of the West-India physicians, under all the modes of practice which have been adopted in the islands. Dr. Desportes lost one half of all the patients he attended in the yellow fever in one season in St. Domingo.* His remedies were *moderate* bleeding and purging, and the copious use of diluting drinks. Dr. Bisset says, "The yellow fever is often under particular circumstances very fatal, carrying off four or five in seven whom it attacks, and sometimes, but seldom, it is so favourable as to carry off only one patient in five or six."† The doctor does not describe the practice under which this mortality takes place.

Dr. Home, I have elsewhere remarked,‡ lost "one out of four of his patients in Jamaica." His remedies were *moderate* bleeding and purging, and afterwards bark, wine, and external applications of blankets dipped in hot vinegar.

Dr. Blane pronounces the yellow fever to be "one of the most fatal diseases to which the human body is subject, and in which human art is the most unavailing." His remedies were bleeding, bark, blisters, acid drinks, saline draughts and camomile tea.

Dr. Chisholm acknowledges that he lost one in twelve of all the patients he attended in the fever of Granada. His principal remedy was a salivation. I shall hereafter show the inferiority of this single mode of depleting, to a combination of it with bleeding and purging. In Philadelphia and Baltimore, where bleeding, purging, and salivation were used in due time, and after the manner that has

* Vol. i. p. 55.

† Medical Essays and Observations, p. 29.

‡ Account of the Yellow Fever of 1793.

been described, not more than one in fifty died of the yellow fever. It is probable that greater certainty and success in the treatment of this disease will not easily be attained, for idiosyncrasy, and habits of intemperance which resist or divert the operation of the most proper remedies, a dread of the lancet, or the delay of an hour in the use of it, the partial application of that or any other remedy, the unexpected recurrence of a paroxysm of fever in the middle of the night, or the clandestine exhibition of wine or laudanum by friends or neighbours, often defeat the best concerted plans of cure by a physician. Heaven in this, as in other instances, kindly limits human power and benevolence, that in all situations man may remember dependence upon the power and goodness of his Creator.

AN ACCOUNT
OF
SPORADIC CASES
OF
BILIOUS YELLOW FEVER,
IN PHILADELPHIA,
IN THE YEARS 1795 AND 1796.

AN ACCOUNT, &c.

IN my account of the yellow fever, as it appeared in Philadelphia in the year 1794, I took notice of several cases of it which occurred in the spring of the year 1795. Before I proceed to deliver the history of this disease as it appeared in 1797, I shall mention the diseases and state of the weather which occurred during the remaining part of the year 1795, and the whole of the year 1796. This detail of facts, apparently uninteresting to the reader in the present state of our knowledge of epidemics, may possibly lead to principles at a future day.

The month of April, 1795, was wet and cold. All the diseases of this month partook of the inflammatory character of the preceding winter and autumn, except the measles, which were unusually mild.

The weather in May was alternately wet, cool, and warm. A few cases of malignant fever occurred this month, but with moderate symptoms. In June the weather was cool and pleasant. The measles put on more inflammatory symptoms than in the preceding months. I had two cases of mania under my care this month, and one of rheumatism, which were attended with intermissions and exacerbations every other day.

The weather on the 19th, 20th, 21st, and 22d days of July was very warm, the mercury being at 90° in Fahrenheit's thermometer. The fevers of this month were all accompanied with black discharges from the bowels. Mr. Kittera, one of the representatives of Pennsylvania in the congress of the United States, in consequence of great fatigue on a warm day, was affected with the usual symptoms of the yellow fever. During his illness he constantly complained of more pain in the left, than in the right side of his head. His pulse was more tense in his left, than in his

right arm. During his convalescence, it was more quick in the left arm, than it was in the right. He was cured by a salivation and the loss of above 100 ounces of blood. His head-ach was relieved by the application of a bladder half filled with ice to his forehead.

Most of the cases of bilious fever, which came under my notice, were attended with quotidian, tertian, or quartan intermissions. In a few of my patients there was a universal rash.

Dr. Woodhouse informed me, that he had seen several instances in which the yellow fever appeared in the same place in which some soldiers had laboured under the dysentery. These facts show the unity of fever, and the impracticability of a nosological arrangement of diseases.

The cholera infantum was severe and fatal, in many instances, during this month. It yielded to blood-letting in a child of Mr. Conyngham, which was but four months old. In a child of seven weeks old which came under my care, I observed the coldness, chills, hot fits, and remissions of the bilious fever to be as distinctly marked as ever I had seen them in adult patients. In a child of Mr. Darrach, aged 5 months, the discharges from the bowels were of a black colour. I mention these facts in support of an opinion I formerly published, that the cholera infantum is a bilious fever, and that it rises and falls in its violence with the bilious fever of grown persons.

About the latter end of this month and the beginning of August, there were heavy showers of rain, which carried away fences, bridges, barns, mills, and dwelling-houses in many places. Several cases of bilious yellow fever occurred in the month of August. In one of them it was accompanied with that morbid affection in the wind-pipe which has been called cynanche trachealis. It was remarkable that sweating became a more frequent symptom of the fevers of this month than it had been in July. Hippocrates ascribed this change in the character of bilious fevers to rainy weather. Perhaps it was induced by the rain which fell in the beginning of the month, in the fevers which have been named.

Among the persons affected with the yellow fever during this month, was William Bradford, Esq. the attorney-general of the United States. From a dread of the lancet

he objected to being bled in the early stage of his disease, in consequence of which he died on the 23d of August, in the 39th year of his age, amidst the tears of numerous friends, and the lamentations of his whole country.

On the 30th and 31st of August, there was a fall of rain, which suddenly checked the fever of the season, insomuch that the succeeding autumnal months were uncommonly healthy. Several showers of rain had nearly the same effect in New-York, where this fever carried off, in a few weeks, above 700 persons. It prevailed, at the same time, and with great mortality, in the city of Norfolk, in Virginia.

In both those cities, as well as in Philadelphia, the disease was evidently derived from putrid exhalation.

In the same month, the dysentery prevailed in New-Haven, in Connecticut, and in the same part of the town in which the yellow fever had prevailed the year before. The latter disease was said to have been imported, but the prevalence of the dysentery, under the above circumstances, proved that both diseases were of domestic origin.

The fever, as it appeared in Philadelphia, yielded in most cases to depleting remedies. After purging and blood-letting, I gave bark, where the fever intermitted, with advantage. It was effectual only when given in large doses. In one instance, it induced a spitting of blood, which obliged me to lay it aside.

The winter of 1796 was uncommonly moderate. There fell a good deal of rain, but little snow. The navigation of the Delaware was stopped but two or three days during the whole season. Catarrhs were frequent, but very few violent or acute diseases occurred in my practice. The month of March and the first week in April were uncommonly dry. Several cases of malignant bilious fever came under my care during these months. A little girl, of five years old, whom I lost in this fever, became yellow in two hours after her death.

The measles prevailed in April, and were of a most inflammatory nature. The weather in May and June was uncommonly wet. The fruit was much injured, and a great deal of hay destroyed by it. On the 14th of June, General Stewart died, with all the usual symptoms of a fatal yellow fever. Several other cases of it, in this and in

the succeeding month, proved mortal, but they excited no alarm in the city, as the physicians who attended them called them by other names.

The rain which fell about the middle of July checked this fever. August, September, and October were unusually healthy. A few cases of malignant sore throat appeared in November. They were, in all the patients that came under my notice, attended with bilious discharges from the stomach and bowels. So little rain fell during the autumnal months, that the wheat perished in many places. The weather in December was extremely cold. The lamps of the city were, in several instances, extinguished by it, on the night of the 23d of the month, at which time the mercury stood at 2° below 0 in the thermometer.

The yellow fever prevailed this year in Charleston, in South-Carolina, where it was produced by putrid exhalations from the cellars of houses which had been lately burnt. It was said by the physicians of that place not to be contagious. The same fever prevailed, at the same time, at Wilmington, in North-Carolina, and at Newburyport, in the state of Massachusetts. In the latter place, it was produced by the exhalation of putrid fish, which had been carelessly thrown upon a wharf.

MEDICAL INQUIRIES

AND

OBSERVATIONS.

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AN ACCOUNT
OF THE
BILIOUS REMITTING AND INTERMITTING
YELLOW FEVER,
AS IT
APPEARED IN PHILADELPHIA,
IN 1797.

VOL. IV.

A

AN ACCOUNT, &c.

THE winter of 1797 was in general healthy. During the spring, which was cold and wet, no diseases of any consequence occurred. The spring vegetables were late in coming to maturity, and there were every where in the neighbourhood of Philadelphia scanty crops of hay. In June and July there fell but little rain. Dysenteries, choleras, scarlatina, and mumps, appeared in the suburbs in the latter month. On the 8th of July I visited Mr. Frisk, and on the 25th of the same month I visited Mr Charles Burrell in the yellow fever, in consultation with Dr. Physick. They both recovered by the use of plentiful depleting remedies.

The weather from the 2d to the 9th of August was rainy. On the 1st of this month I was called to visit Mr. Nathaniel Lewis, in a malignant bilious fever. On the 3d I visited Mr. Elisha Hall, with the same disease. He had been ill several days before I saw him. Both these gentlemen died on the 6th of the month. They were both very yellow after death. Mr. Hall had a black vomiting on the day he died.

The news of the death of these two citizens, with unequivocal symptoms of yellow fever, excited a general alarm in the city. Attempts were made to trace it to importation, but a little investigation soon proved that it was derived from the foul air of a ship which had just arrived from Marseilles, and which discharged her cargo at Pine-street wharf, near the stores occupied by Mr. Lewis and Mr. Hall. Many other persons about the same time were affected with the fever from the same cause, in Water and Penn-streets. About the middle of the month, a ship from Hamburgh communicated the disease, by means of her foul air, to the village of Kensington. It prevailed, moreover, in many instances in the suburbs, and in Kensington, from putrid exhalations from gutters and marshy grounds,

at a distance from the Delaware, and from the foul ships which have been mentioned. Proofs of the truth of each of these assertions were afterwards laid before the public.

The disease was confined chiefly to the district of Southwark and the village of Kensington, for several weeks. In September and October, many cases occurred in the city, but most of them were easily traced to the above sources.

The following account of the weather, during the months of August, September, and October, was obtained from Mr. Thomas Pryor. It is different from the weather in 1793. It is of consequence to attend to this fact, inasmuch as it shows that an inflammatory constitution of the atmosphere can exist under different circumstances of the weather. It likewise accounts for the variety in the symptoms of the fever in different years and countries. Such is the influence of season and climate upon the symptoms of this fever, that it led Dr. M^cKitterick to suppose that the yellow fever of Charleston, so accurately described by Dr. Lining, in the second volume of the *Physical and Literary Essays of Edinburgh*, was a different disease from the yellow fever of the West-Indies.*

* *De Febre India-Occidentalis Maligna Flava*, p. 12.

METEOROLOGICAL OBSERVATIONS, MADE IN PHILADELPHIA.

AUGUST, 1797.

D.	Ther.		Bar.		Winds and Weather.
1	73	75	30	0	S. E. E. Rain in the forenoon and afternoon.
2	72	76	30	0	N. E. by E. Cloudy, with rain in the afternoon and night. Wind E. by N.
3	72	78	30	6	E. $\frac{1}{2}$ N. Rain in the morning, and all day and night.
4	72	78	30	4	E. Rained hard all day and at night.
5	74	79	29	84	Wind light, S.W. Cloudy. Rain this morning. The air extremely damp; wind shifted to N.W. This evening heavy showers, with thunder.
6	73	76	30	86	W. N.W. Cloudy.
7	70	76	30	4	N.W. Close day. Rain in the evening and all night. Wind to E.
8	72	76	29	95	E. Rain this morning.
9	72	76	29	86	S. W. Cloudy morning.
10	69	73	30	16	N. W. Clear.
11	70	74	30	25	N. W. Clear. Rain all night.
12	71	74	30	5	S. W. Cloudy. Rain in the morning. Cloudy all day. Rain at night.
13	73	75	29	87	S. W. Cloudy. Rain all day.
14	70	74	29	9	N. W. Clear fine morning.
15	66	60	30	15	N. W. Clear fine morning.
16	60	64	30	24	N. W. Clear fine morning.
17	60	65	30	24	N. W. Air damp.
18	68	75	30	4	S. W. Cloudy. Rain, with thunder at night: a fine shower.
19	72	78	29	7	N. W. Clear. Cloudy in the evening, with thunder.
20	70	77	29	8	W. N. W. Fine clear morning.
21	74	76	29	9	N. W. Clear to E.
22	68	76			E. Small shower this morning. Hard shower at 11, A. M. Wind N. E.
23	71	76	29	92	E. Cloudy. At noon calm.
24	71	75	29	95	Calm morning and clear.
25	70	75	30	5	N. E. Clear. Rain in the afternoon, with thunder.
26	70	75	30	5	S. E. Rain in the morning. Rained hard in the night, with thunder, N. W.
27	68	76	29	9	N. W. Fine clear morning.
28	64	75	29	96	N. W. Clear.
29	59	70	30	0	E. Clear.
30	70	76	30	1	E. by S. Rain in the morning.
31	68	74	30	14	S. E. Cloudy. Damp air and sultry.

SEPTEMBER, 1797.

D.	Ther.		Bar.		Winds and Weather.
1	73	80	36	6	S. W. Cloudy. Damp air. Rain in the morning.
2	79	80	29	9	N. W. Clear. Cloudy in the evening, with lightning to the southward.
3	68	74	30	0	N. by W. Cloudy. Clear in the afternoon and night.
4	60	74	30	7	W. N. W. Clear fine morning.
5	58	73	30	1	N. W. Clear. Cloudy in the evening.
6	58	72	30	13	Fresh at E. Clear. Rain in the evening.
7	56	76	30	28	E. Clear. Cloudy in the evening.
8	54	66	30	1	N. E. Clear and cool morning. Flying clouds at noon.
9	56	65	30	1	E. N. E. Clear.
10	58	63	30	26	N. E. Clear fine morning. Wind fresh at N. E. all day.
11	53	64	30	13	N. to E. with flying clouds.
12	51	62	30	6	W. N. W. Clear cool morning.
13	56	67	30	3	S. W. Cloudy. Clear in the afternoon.
14	64	70	29	98	S. W. Clear.
15	66	73	29	85	S. W. Rain in the morning. Cloudy in the afternoon.
16	62	70	29	95	N. W. Clear.
17	56	67	30	0	N. W. Clear.
18	58	63	29	88	E. Cloudy. Rained all day, and thunder.
			29	62	Rained very heavy at night.
19	55	63	29	75	W. N. W. Clear fine morning.
20	47	63	30	8	W. N. W. Clear fine morning. New moon at 9 50 morning.
21	46	60	30	0	N. E. Clear fine morning; to S. E. in the evening. Cloudy at night.
22	56	65	30	4	N. W. Rain in the morning. Rain at night.
23	56	66	30	0	N. N. E. Cloudy.
24	52	66	29	9	E. by S. Clear fine morning. Cloudy at night.
			29	78	
25	57	68	29	37	W. N. W. Clear fine morning; clear all day.
26	58	68	29	95	E. In the morning flying clouds.
27	48	63	30	2	N. W. Clear fine morning; clear all day.
28	48	63	30	2	W. N. W. Clear fine morning; clear all day.
29	54	63	30	15	E. Clear fine morning.
30	6	65	30	26	E. Fresh. Cloudy morning. Rain in the night.

OCTOBER, 1797.

D.	Ther.	Bar.	Winds and Weather.
1	55	65 30 16	N. E. Rain this morning, and great part of the day.
2	55	66 30 0	N. W. Clear.
3	60	70 29 9	S. E. Clear. Air damp.
4	60	70 29 5	W. N. W. Rain this morning.
5	46	60 30 0	W. N. W. to S. by W. in the evening. Clear all day. White frost this morning.
6	55	65 30 0	S. W. Clear fine morning. White frost.
7	56	76 30 0	S. W. Cloudy. Rain in the night.
8	56	70 30 29	S. Cloudy this morning; air damp. Wind shifted to W. N. W. Blows fresh.
9	50	60 30 85	W. N. W. Clear morning. Fresh at N. W. in the evening.
10	40	58 30 1	W. N. W. Clear. Frost this morning.
11	38	56 30 2	W. N. W. Cloudy.
12	34	52 30 38	W. N. W. Clear. Ice this morning.
13	35	55 30 5	N. Clear fine morning. Ice this morning.
14	40	60 30 28	N. E. Cloudy.
15	50	65 30 16	W. N. W. Clear.
16	36	56 30 2	W. N. W. Clear fine morning.
17	37	56 30 18	W. N. W. Clear fine morning.
18	47	60 29 86	W. N. W. Clear fine weather.
19	48	60 30 6	N. W. Clear fine day.
20	42	55 30 8	N. E. Cloudy. Rain in the afternoon and night. Blows fresh at N. E.
21	42	50 29 92	N. E. Blows fresh (with a little rain.) Thunder in the night, with rain.
22	44	56 29 57	N. W. Rain in the morning.
23	44	56 29 95	S. W. Clear fine morning.
24	42	54 30 5	N. E. Cloudy. A great deal of rain in the night.
25	40	52 30 15	N. E. Clear fine morning.
26	36	48 30 29	W. N. W. Clear.
27	34	46 30 23	Fresh at S. W. Clear.
28	40	52 29 95	W. N. W. Cloudy.
29	34	46 29 82	W. Cloudy.
30	32	42 29 93	N. W. Clear. Hard frost this morning.
31	38	48 30 18	W. S. W. Cloudy part of this day; clear the remainder.

In addition to the register of the weather it may not be improper to add, that moschetoës were more numerous during the prevalence of the fever than in 1793. An unusual number of ants and cock-roaches were likewise observed: and it was said that the martins and swallows disappeared, for a while, from the city and its neighbourhood.

A disease prevailed among the cats some weeks before the yellow fever appeared in the city. It excited a belief in an unwholesome state of the atmosphere, and apprehensions of a sickly fall. It generally proved fatal to them.

After the first week in September there were no diseases to be seen but yellow fever. In that part of the town which is between Walnut and Vine-streets it was uncommonly healthy. A similar retreat of inferior diseases has been observed to take place during the prevalence of the plague in London, Holland, and Germany, according to the histories of that disease by Sydenham, Diemerbroek, Senner-tus, and Hildanus. It appears, from the register of the weather, that it rained during the greatest part of the day on the 1st of October. The effects of this rain upon the disease shall be mentioned hereafter. On the 10th the weather became cool, and on the nights of the 12th and 13th of the month there was a frost accompanied with ice, which appeared to give a sudden and complete check to the disease.

The reader will probably expect an account of the effects of this distressing epidemic upon the public mind. The terror of the citizens for a while was very great. Rumours of an opposite and contradictory nature of the increase and mortality of the fever were in constant circulation. A stoppage was put to business, and it was computed that about two thirds of the inhabitants left the city.

The legislature of the state early passed a law, granting 10,000 dollars for the relief of the sufferers by the fever. The citizens in and out of town, as also many of the citizens of our sister states, contributed more than that sum for the same charitable purpose. This money was issued by a committee appointed by the governor of the state. An hospital for the reception of the poor was established on the east side of the river Schuylkill, and amply provided with every thing necessary for the accommodation of the

sick. Tents were likewise pitched on the east side of Schuylkill, to which all those people were invited who were exposed to the danger of taking the disease, and who had not means to provide a more comfortable retreat for themselves in the country.

I am sorry to add that the mortal effects of the fever upon the minds of our citizens were confined chiefly to these acts of benevolence. Many of the publications in the newspapers upon its existence, mode of cure, and origin, partook of a virulent spirit, which ill accorded with the distresses of the city. It was a cause of lamentation likewise to many serious people, that the citizens in general were less disposed, than in 1793, to acknowledge the agency of a divine hand in their afflictions. In some a levity of mind appeared upon this solemn occasion. A worthy bookseller gave me a melancholy proof of this assertion, by informing me, that he had never been asked for playing cards so often, in the same time, as he had been during the prevalence of the fever.

Philadelphia was not the only place in the United States which suffered by the yellow fever. It prevailed, at the same time, at Providence, in Rhode-Island, at Norfolk, in Virginia, at Baltimore, and in many of the country towns of New-England, New-Jersey, and Pennsylvania.

The influenza followed the yellow fever, as it did in the year 1793. It made its appearance in the latter end of October, and affected chiefly those citizens who had been out of town.

The predisposing causes of the yellow fever, in the year 1797, were the same as in the year 1793. Strangers were as usual most subject to it. The heat of the body in such persons, in the West-Indies, has been found to be between three and four degrees above that of the temperature of the natives. This fact is taken notice of by Dr. M^rKitterick, and to this he ascribes, in part, the predisposition of new comers to the yellow fever.

In addition to the common exciting causes of this disease formerly enumerated, I have only to add, that it was induced in one of my patients by smoking a segar. He had not been accustomed to the use of tobacco.

I saw no new premonitory symptoms of this fever, except a tooth-ach. It occurred in Dr. Physick, Dr. Cald.

well, and in my pupil, Mr. Bellenger. In Miss Elliot there was such a soreness in her teeth, that she could hardly close her mouth on the day in which she was attacked by the fever. Neither of these persons had taken mercury to obviate the disease.

I shall now deliver a short account of the symptoms of the yellow fever, as they appeared in several of the different systems of the body.

I. There was but little difference in the state of the pulse in this epidemic from what has been recorded in the fevers of 1793 and 17 4. I perceived a pulse, in several cases, which felt like a soft quill which had been *shattered* by being trodden upon. It occurred in Dr. Jones and Dr. Dobell, and in several other persons who had been worn down by great fatigue, and it was, in every instance, followed by a fatal issue of the fever. In Dr. Jones this state of the pulse was accompanied with such a difficulty of breathing, that every breath he drew, on the day of his attack, he informed me, was the effort of a sigh. He died on the 17th of September, and on the sixth day of his fever.

The action of the arteries was, as usual, very irregular in many cases. In some there was a distressing throbbing of the vessels in the brain, and in one of my patients a similar sensation in the bowels, but without pain. Many people had issues of blood from their blisters in this fever.

I saw nothing new in the effects of the fever upon the liver, lungs, brain, nor upon the stomach and bowels.

II. The excretions were distinguished by no unusual marks. I met with no recoveries where there were not black stools. They excoriated the rectum in Dr. Way. It was a happy circumstance where morbid bilious matter came away in the beginning of the disease. But it frequently resisted the most powerful cathartics until the 5th or 7th day of the fever, at which time it appeared rather to yield to the disorganization of the liver than to medicine. Where sufficient blood-letting had been previously used, the patient frequently recovered, even after the black discharges from the bowels took place in a late stage of the disease.

Dr. Coxe informed me that he attended a child of seventeen months old which had *white* stools for several

days. Towards the close of its disease it had black stools, and soon afterwards died.

Several of my patients discharged worms during the fever. In one instance they were discharged from the mouth.

A preternatural frequency in making pale water attended the first attack of the disease in Mr. Joseph Fisher.

A discharge of an unusual quantity of urine preceded a few hours, the death of the daughter of Mrs. Read.

In two of my patients there was a total suppression of urine. In one of them it continued five days without exciting any pain.

There was no disposition to sweat after the first and second days of the fever. Even in those states of the fever, in which the intermissions were most complete, there was seldom any moisture, or even softness on the skin. This was so characteristic of malignity in the bilious fever, that where I found the opposite state of the skin, towards the close of a paroxysm, I did not hesitate to encourage my patient, by assuring him that his fever was of a mild nature, and would most probably be safe in its issue.

III. I saw no unusual marks of the disease in the nervous system. The mind was seldom affected by delirium after the loss of blood. There was a disposition to shed tears in two of my patients. One of them wept during the whole time of a paroxysm of the fever. In one case I observed an uncommon dullness of apprehension, with no other mark of a diseased state of the mind. It was in a man whose faculties, in ordinary health, acted with celerity and vigour.

Dr. Caldwell informed me of a singular change which took place in the operations of his mind during his recovery from the fever. His imagination carried him back to an early period of his life, and engaged him, for a day or two, in playing with a bow and arrow, and in amusements of which he had been fond of when a boy. A similar change occurred in the mind of my former pupil, Dr. Fisher, during his convalescence from the yellow fever in 1793. He amused himself for two days in looking over the pictures of a family bible which lay in his room, and declared that he found the same kind of pleasure in this employment that he did when a child. How.

ever uninteresting these facts may now appear, the time will come when they may probably furnish useful hints for completing the physiology and pathology of the mind.

Where blood-letting had not been used, patients frequently died of convulsions.

IV. The senses of seeing and feeling were impaired in several cases. Mrs. Bradford's vision was so weak that she hardly knew her friends at her bed-side. I had great pleasure in observing this alarming symptom, suddenly yield to the loss of four ounces of blood.

Several persons who died of this fever did not, from the beginning to the end of the disease, feel any pain. I shall hereafter endeavour to explain the cause of this insensible state of the nerves.

The appetite for food was unimpaired for three days in Mr. Andrew Brown, at a time when his pulse indicated a high grade of the fever. I heard of several persons who ate with avidity just before they died.

V. Glandular swellings were very uncommon in this fever. I should have ascribed their absence to the copious use of depleting remedies in my practice, had I not been informed that morbid affections of the lymphatic glands were unknown in the city hospital, where blood-letting was seldom used, and where the patients, in many instances, died before they had time to take medicine of any kind.

VI. The skin was cool, dry, smooth, and even shining in some cases. Yellowness was not universal. Those small red spots which has been compared to mosquito bites occurred in several of my patients. Dr. John Duffield, who acted as house surgeon and apothecary at the city hospital, informed me that he saw vibices on the skin in many cases, and that they were all more or less sore to the touch.

VII. The blood was dissolved in a few cases. That appearance of the blood, which has been compared to the washings of flesh, was very common. It was more or less sizzly towards the close of the disease in most cases. I have suspected, from this circumstance, that this mark of ordinary morbid action or inflammation was in part the effect of the mercury acting upon the blood-vessels. It is well known that sizzly blood generally accompanies a salivation. If this conjecture be well founded, it will not

militate against the use of mercury in malignant fevers, for it shows that this valuable medicine possesses a power of changing an extraordinary and dangerous degree of morbid action in the blood-vessels to that which is more common and safe. I have seldom seen a yellow fever terminate fatally after the appearance of sily blood.

Dr. Stewart informed me, that in those cases in which the serum of the blood had a yellow colour, it imparted a saline taste only to his tongue. He was the more struck with this fact, as he perceived a strong bitter taste upon his skin, in a severe attack of the yellow fever in 1793.

I proceed next to take notice of the type of the fever.

In many cases, it appeared in the form of a remitting and intermitting fever. The quotidian and tertian forms were most common. In Mr. Robert Warton, it appeared in the form of a quartian. But it frequently assumed the character which is given of the same fever in Charleston, by Dr. Lining. It came on without chills, and continued without any remission for three days, after which the patient believed himself to be well, and sometimes rose from his bed, and applied to business. On the fourth or fifth day, the fever returned, and unless copious evacuations had been used in the early stage of the disease, it generally proved fatal. Sometimes the powers of the system were depressed below the return of active fever, and the patient sunk away by an easy death, without pain, heat, or a quick pulse. I have been much puzzled to distinguish a crisis of the fever on the third or fourth day, from the insidious appearance which has been described. It deceived me in 1793. It may be known by a preternatural coolness in the skin, and languor in the pulse, by an inability to sit up long without fatigue or faintness, by a dull eye, and by great depression of mind, or such a flow of spirits as sometimes to produce a declaration from the patient that "he feels too well." Where these symptoms appear, the patient should be informed of his danger, and urged to the continuance of such remedies as are proper for him.

The following states or forms were observable in the fever:

1. In a few cases, the miasmata produced death in four and twenty hours, with convulsions, coma, or apoplexy.

2. There were *open* cases, in which the pulse was full and tense as in a pleurisy or rheumatism, from the beginning to the end of the fever. They were generally attended with a good deal of pain.

3. There were *depressed* or *locked* cases, in which there were a season of great debility, but little or no pain, a depressed and slow pulse, a cool skin, cold hands and feet, and obstructed excretions.

4. There were *divided* or *mixed* cases, in which the pulse was active until the 4th day, after which it became depressed. All the other symptoms of the locked state of the fever accompanied this depressed state of the pulse.

5. There were cases in which the pulse imparted a perception like that of a soft and *shattered* quill. I have before mentioned that this state of the pulse occurred in Dr. Jones and Dr. Dobell. I felt it but once, and on the day of his attack, in the latter gentleman, and expressed my opinion of his extreme danger to one of my pupils upon my return from visiting him. I did not meet with a case which terminated favourably, where I perceived this *shattered* pulse. A disposition to sweat occurred in this state of the fever.

6. There were what Dr. Caldwell happily called *walking* cases. The patients here were flushed or pale, had a full or tense pulse, but complained of no pain, had a good appetite, and walked about their room or houses, as if they were but little indisposed, until a day or two, and, in some instances, until a few hours before they died. We speak of a *dumb* gout and *dumb* rheumatism; with equal propriety, the epithet might be applied to this form of yellow fever in its early stage. The impression of the remote cause of the fever, in these cases, was beyond sensation, for, upon removing a part of it by bleeding or purging, the patients complained of pain, and the excitement of the muscles passed so completely into the blood-vessels and alimentary canal, as to convert the fever into a common and more natural form. These cases were always dangerous; and, when neglected, generally terminated in death. Mr. Brown's fever came on in this insidious shape. It was cured by the loss of upwards of 100 ounces of blood, and a plentiful salivation.

7. There was the *intermitting* form in this fever. This, like the last, often deceived the patient, by leading him to suppose his disease was of a common or trifling nature. It prevented Mr. Richard Smith from applying for medical aid in an attack of the fever for several days, by which means it made such an impression upon his viscera, that depleting remedies were in vain used to cure him. He died in the prime of life, beloved and lamented by a numerous circle of relations and friends.

8. There was a form of this fever in which it resembled the mild remittent of common seasons. It was distinguished from it chiefly by the black colour of the intestinal evacuations.

9. There were cases of this fever so light, that patients were said to be neither *sick* nor *well*; or, in other words, they were sick and well half a dozen times in a day. Such persons walked about, and transacted their ordinary business, but complained of dulness, and, occasionally, of shooting pains in their heads. Sometimes the stomach was affected with sickness, and the bowels with diarrhœa or costiveness. All of them complained of night sweats. The pulse was quicker than natural, but seldom had that convulsive action which constitutes fever. Purges always brought away black stools from such patients, and this circumstance served to establish its relationship to the prevailing epidemic. Now and then, by neglect or improper treatment, it assumed a higher and more dangerous grade of the fever, and became fatal, but it more commonly yielded to nature, or to a single dose of purging physic.

10. There were a few cases in which the skin was affected with universal yellowness, but without more pain or indisposition than usually occurs in the jaundice. They were very frequent in the year 1795, and generally prevailed in the autumn, in all places subject to bilious fever.

12. There were *chronic* cases of this fever. It is from the want of observation that physicians limit the duration of the yellow fever to certain days. I have seen many instances in which it has been protracted into what is called by authors a slow nervous fever. The wife of captain Peter Bell died with a black vomiting after an illness of nearly one month. Dr. Pinckard, formerly one of

the physicians of the British army in the West-Indies, in a late visit to this city informed me, that he had often seen the yellow fever put on a chronic form in the West-India islands.

In delivering this detail of the various forms of the yellow fever, I am aware that I oppose the opinions of many of my medical brethren, who ascribe to it a certain uniform character, which is removed beyond the influence of climate, habit, predisposition, and the different strength and combinations of remote and exciting causes. This uniformity in the symptoms of this fever is said to exist in the West Indies, and every deviation from it in the United States is called by another name. The following communication, which I received from Dr. Pinckard, will show that this disease is as different in its forms in the West Indies as it is in this country.

“The yellow fever, as it appeared among the troops in Guiana and the West India islands, in the year 1796 and 1797, exhibited such perpetual instability, and varied so incessantly in its character, that I could not discover any one symptom to be decidedly diagnostic; and hence I have been led into an opinion that the yellow fever, so called, is not a distinct or specific disease, but merely an aggravated degree of the common remittent or bilious fever of hot climates, rendered irregular in form, and augmented in malignity, from appearing in subjects unaccustomed to the climate.

“Philadelphia, January 12th, 1798.”

Many other authorities equally respectable with Dr. Pinckard's, among whom are Pringle, Huck, and Hunter, might be adduced in support of the unity of bilious fever. But to multiply them further would be an act of homage to the weakness of human reason, and an acknowledgment of the infant state of our knowledge in medicine. As well might we suppose nature to be an artist, and that diseases were shaped by her like a piece of statuary or a suit of clothes, by means of a chisel, or pair of scissars, as admit every different form and grade of morbid action in the system to be a distinct disease.

Notwithstanding the fever put on the eleven forms which have been described, the moderate cases were few, com-

pared with those of a malignant and dangerous nature. It was upon this account that the mortality was greater in the same number of patients, who were treated with the same remedies, than it was in the years 1793 and 1794. The disease, moreover, partook of a more malignant character than the two epidemics that have been mentioned. The yellow fever in Norfolk, Drs. Taylor and Hansford informed me, in a letter I received from them, was much more malignant and fatal, under equal circumstances, than it was in 1795.

There were evident marks of the disease attacking more persons three days before, and three days after the *full and change* of the moon, and of more deaths occurring at those periods than at any other time. The same thing has been remarked in the plague by Diemerbroeck, in the fevers of Bengal by Dr. Balfour, and in those of Demarara by Dr. Pinckard.

During the prevalence of the fever I attended the following persons who had been affected by the epidemic of 1793, viz. Dr. Physick, Thomas Leaming, Thomas Canby, Samuel Bradford, and George Loxley, also Mrs. Eggar, who had a violent attack of it in the year 1794. Samuel Bradford was likewise affected by it in 1794.

During my intercourse with the sick, I felt the miasmata of the fever operate upon my system in the most sensible manner. It produced languor, a pain in my head, and sickness at my stomach. A sighing attended me occasionally, for upwards of two weeks. This symptom left me suddenly, and was succeeded by a hoarseness, and, at times, with such a feebleness in my voice as to make speaking painful to me. Having observed this affection of the trachea to be a precursor of the fever in several cases, it kept me under daily apprehensions of being confined by it. It gradually went off after the first of October. I ascribed my recovery from it, and a sudden diminution of the effects of the miasmata upon my system, to a change produced in the atmosphere by the rain which fell on that day.

The peculiar matter emitted by the breath or perspiration of persons affected by this fever, induced a sneezing in Dr. Dobell, every time he went into a sick room.

Ambrose Parey says the same thing occurred to him, upon entering the room of patients confined by the plague.

The gutters emitted, in many places, a sulphureous smell during the prevalence of the fever. Upon rubbing my hands together I could at any time excite a similar smell in them. I have taken notice of this effect of the matters which produced the disease upon the body, in the year 1794.

In order to prevent an attack of the fever, I carefully avoided all its exciting causes. I reduced my diet, and lived sparingly upon tea, coffee, milk, and the common fruits and garden vegetables of the season, with a small quantity of salted meat, and smoked herring. My drinks were milk and water, weak claret and water, and weak porter and water. I sheltered myself as much as possible from the rays of the sun, and from the action of the evening air, and accommodated my dress to the changes in the temperature of the atmosphere. By similar means, I have reason to believe, many hundred people escaped the disease, who were constantly exposed to it.

The number of deaths by the fever, in the months of August, September, and October, amounted to between ten and eleven hundred. In the list of the dead were nine practitioners of physic, several of whom were gentlemen of the most respectable characters. This number will be thought considerable when it is added, that not more than three or four and twenty physicians attended patients in the disease. Of the survivors of that number, eight were affected with the fever. This extraordinary mortality and sickness among the physicians must be ascribed to their uncommon fatigue in attending upon the sick; and to their inability to command their time and labours, so as to avoid the exciting causes of the fever.

Among the medical gentlemen whose deaths have been mentioned, was my excellent friend, Dr. Nicholas Way. I shall carry to my grave an affectionate remembrance of him. We passed our youth together in the study of medicine, and lived to the time of his death in the habits of the tenderest friendship. In the year 1794, he removed from Wilmington, in the Delaware state, to Philadelphia, where his talents and manners soon introduced him into extensive business. His independent fortune furnished his

friends with arguments to advise him to retire from the city, upon the first appearance of the fever. But his humanity prevailed over the dictates of interest and the love of life. He was active and intelligent in suggesting and executing plans to arrest the progress of the disease, and to lessen the distresses of the poor. On the 27th of August, he was seized, after a ride from the country in the evening air, with a chilly fit and fever. I saw him the next day, and advised the usual depleting remedies. He submitted to my prescriptions with reluctance, and in a sparing manner, from an opinion that his fever was nothing but a common remittent. To enforce obedience to my advice, I called upon Dr. Griffiths to visit him with me. Our combined exertions to overcome his prejudices against our remedies were ineffectual. At two o'clock in the afternoon, on the sixth day of his disease, with an aching heart I saw the sweat of death upon his forehead, and felt his cold arm without a pulse. He spoke to me with difficulty: upon rising from his bed-side to leave him, his eyes filled with tears, and his countenance spoke a language which I am unable to describe. I promised to return in a short time, with a view of attending the last scene of his life. Immediately after I left his room, he wept aloud. I returned hastily to him, and found him in convulsions. He died a few hours afterwards. Had I met with no other affliction in the autumn of 1797 than that which I experienced from this affecting scene, it would have been a severe one; but it was a part only of what I suffered from the death of other friends, and from the malice of enemies.

I beg the reader's pardon for this digression. It shall be the last time and place in which any notice shall be taken of my sorrows and persecutions in the course of these volumes.

Soon after the citizens returned from the country, the governor of the state, Mr. Mifflin, addressed a letter to the college of physicians of Philadelphia, requesting to know the origin, progress, and nature of the fever which had recently afflicted the city, and the means of preventing its return. He addressed a similar letter to me, to be communicated to such gentlemen of the faculty of medicine as were not members of the college of physicians.

The college, in a memorial to the legislature of the state,

asserted that the fever had been imported in two ships, the one from Havannah, the other from Port au Prince, and recommended, as the most effectual means of preventing its recurrence, a more rigid quarantine law.

The gentlemen of the faculty of medicine, thirteen in number, in two letters to the governor of the state, the one in their private capacity, and the other after they had associated themselves into an "Academy of Medicine," asserted that the fever had originated from the putrid exhalations from the gutters and streets of the city, and from ponds and marshy grounds in its neighbourhood; also from the foul air of two ships, the one from Marseilles and the other from Hamburgh. They enumerated all the common sources of malignant fevers, and recommended the removal of them from the city, as the most effectual method of preventing the return of the fever. These sources of fever, and the various means of destroying them, shall be mentioned in another place.

I proceed now to say a few words upon the treatment which was used in this fever. It was, in general, the same as that which was pursued in the fevers of 1793 and 1794.

I began the cure, in most cases, by *bleeding*, when I was called on the first day of the disease, and was happy in observing its usual salutary effects in its early stage. On the second day, it frequently failed of doing service, and on the subsequent days of the fever, I believe, it often did harm; more especially if no other depleting remedy had preceded it. The violent action of the blood-vessels in this disease, when left to itself for two or three days, fills and suffocates the viscera with such an immense mass of blood, as to leave a quantity in the vessels so small, as barely to keep up the actions of life. By abstracting but a few ounces of this circulating blood, we precipitate death. In those cases where a doubt is entertained of such an engorgement of stagnating blood having taken place, it will always be safest to take but three or four ounces at a time, and repeat it four or five times a day. By this mode of bleeding, we give the viscera an opportunity of emptying their superfluous blood into the vessels, and thereby prevent their collapsing, from the sudden abstraction of the stimulus which remained in them. I confine this observation upon bleeding, after the first stage of the disease,

only to the epidemic of 1797. It was frequently effectual when used for the first time after the first and second days, in the fevers of 1793 and 1794, and it is often useful in the advanced stage of the common bilious fever. The different and contradictory accounts of the effects of bleeding in the yellow fever, in the West-Indies, probably originate in its being used in different stages of the disease. Dr. Jackson, of the British army, in his late visit to Philadelphia, informed me, that he had cured nineteen out of twenty of all the soldiers whom he attended, by copious bleeding, provided it was performed in six hours after the attack of the fever. Beyond that period, it mitigated its force, but seldom cured. The quantity of blood drawn by the doctor, in this early stage of the disease, was always from twenty to thirty ounces. I have said the yellow fever of 1797 was more malignant than the fevers of 1793 and 1794. Its resemblance to the yellow fever in the West-Indies, in not yielding to bleeding after the first day, is a proof of this assertion.

I was struck, during my attendance upon this fever, in observing the analogy between its *mixed* form and the malignant state of the small-pox. The fever, in both, continues for three or four days without any remission. They both have a second stage, in which death usually takes place, if the diseases be left to themselves. By means of copious bleeding in their first, they are generally deprived of their malignity and mortality in their second stage. This remark, so trite in the small-pox, has been less attended to in the yellow fever. The bleeding in the first stage of this disease does not, it is true, destroy it altogether, any more than it destroys an eruption in the second stage of the small-pox, but it weakens it in such a manner that the patient passes through its second stage without pain or danger, and with no other aid from medicine than what is commonly derived from good nursing, proper aliment, and a little gently opening physic.

It is common with those practitioners who object to bleeding in the yellow fever, to admit it occasionally in *robust* habits. This rule leads to great error in practice. From the weak action of predisposing, or exciting causes, the disease often exists in a feeble state in such habits, while from the protracted or violent operation of the same

causes it appears in great force in persons of delicate constitutions. A physician, therefore, in prescribing for a patient in this fever, should forget the natural strength of his muscles, and accommodate the loss of blood wholly to the morbid strength of his disease.

The quantity of blood drawn in this fever was always proportioned to its violence. I cured many by a single bleeding. A few required the loss of upwards of a hundred ounces of blood to cure them. The persons from whom that large quantity of blood was taken, were, Messieurs Andrew Brown, Horace Hall, George Cummins, J. Ramsay, and George Eyre. But I was not singular in the liberal and frequent use of the lancet. The following physicians drew the quantities of blood annexed to their respective names from the following persons, viz.

Dr. Dewees	176 ounces from	Dr. Physick,
Dr. Griffiths	110	M. S. Thomson,
Dr. Stewart	106	Mrs. M'Phail,
Dr. Cooper	150	Mr. David Evans,
Dr. Gillespie	103	himself.

All the above named persons had a rapid and easy recovery, and now enjoy good health. I lost but one patient who had been the subject of early and copious bleeding. His death was evidently induced by a supper of beef stakes and porter, after he had exhibited the most promising signs of convalescence.

OF PURGING.

From the great difficulty that was found in discharging bile from the bowels, by the common modes of administering purges, Dr. Griffiths suggested to me the propriety of giving large doses of calomel, without jalap or any other purging medicine, in order to loosen the bile from its close connection with the gall-bladder and duodenum, during the first day of the disease. This method of discharging acrid bile was found useful. I observed the same relief from large evacuations of fœtid bile, in the epidemic

of 1797, that I have remarked in the fever of 1793. Mr. Bryce has taken notice of the same salutary effects from similar evacuations, in the yellow fever, on board the *Busbridge* Indiaman, in the year 1792. His words are: "It was observable, that the more dark-coloured and fœtid such discharges were, the more early and certainly did the symptoms disappear. Their good effects were so instantaneous, that I have often seen a man carried up on deck, perfectly delirious with subsultus tendinum, and in a state of the greatest apparent debility, who, after one or two copious evacuations of this kind, has returned of himself, and astonished at his newly acquired strength."* Very different are the effects of tonic remedies, when given to remove this apparent debility. The clown who supposes the crooked appearance of a stick, when thrust into a pail of water, to be real, does not err more against the laws of light, than that physician errs against a law of the animal economy, who mistakes the debility which arises from oppression for an exhausted state of the system, and attempts to remove it by stimulating medicines.

After unlocking the bowels by means of calomel and jalap, in the beginning of the fever, I found no difficulty afterwards in keeping them gently open by more lenient purges. In addition to these which I have mentioned in the account of the fever of 1793, I yielded to the advice of Dr. Griffiths, by adopting the soluble tartar, and gave small doses of it daily in many cases. It seldom offended the stomach, and generally operated, without griping, in the most plentiful manner.

However powerful bleeding and purging were in the cure of this fever, they often required the aid of a *salivation* to assist them in subduing it.

Besides the usual methods of introducing mercury into the system, Dr. Stewart accelerated its action, by obliging his patients to wear socks filled with mercurial ointment; and Dr. Gillespie aimed at the same thing, by injecting the ointment, in a suitable vehicle, into the bowels, in the form of glysters.

The following fact, communicated to me by Dr. Stewart, will show the safety of large doses of calomel in this fever. Mrs. M'Phail took 60 grains of calomel, by

* *Annals of Medicine*, p. 123.

mistake, at a dose, after having taken three or four doses, of 20 grains each, on the same day. She took in all, 356 grains in six days, and yet, says the doctor, "such was the state of her stomach and intestines, that that large quantity was retained without producing the least griping, or more stools than she had when she took three grains every two hours."

I observed the mercury to affect the mouth and throat in the following ways. 1. It sometimes produced a swelling only in the throat, resembling a common inflammatory angina. 2. It sometimes produced ulcers upon the lips, cheeks, and tongue, without any discharge from the salivary glands. 3. It sometimes produced swellings and ulcers in the gums, and loosened the teeth, without inducing a salivation. 4. There were instances in which the mercury induced a rigidity in the masseter muscles of the jaw, by which means the mouth was kept constantly open, or so much closed, as to render it difficult for the patient to take food, and impossible for him to masticate it. 5. It sometimes affected the salivary glands only, producing from them a copious secretion and excretion of saliva. But, 6. It more frequently acted upon all the above parts, and it was then it produced most speedily its salutary effects. 7. The discharge of the saliva frequently took place only during the remission or intermission of the fever, and ceased with each return of its paroxysms. 8. The salivation did not take place, in some cases, until the solution of the fever. This was more especially the case in those forms of the fever in which there was no remissions or intermissions. 9. It ceased in most cases with the fever, but it sometimes continued for six weeks or two months after the complete recovery of the patient. 10. The mercury rarely dislodged the teeth. Not a single instance occurred of a patient losing a tooth in the city hospital, where the physicians, Dr. J. Duffield informed me, relied chiefly upon a salivation for the cure of the fever. 11. Sometimes the mercury produced a discharge of blood with the saliva. Dr. Coulter, of Baltimore, gave me an account, in a letter dated the 17th of September, 1797, of a boy in whom a hæmorrhage from the salivary glands, excited by calomel, was succeeded by a plentiful flow of saliva, which saved his patient. I saw no inconvenience from the mixture of blood with saliva in any of my patients. It occurred in

Dr. Caldwell, Mr. Bradford, Mr. Brown, and several others.

It has been said that mercury does no service unless it purges or salivates. I am disposed to believe that it may act as a counter stimulus to that of the miasmata of the yellow fever, and thus be useful without producing any evacuation from the bowels or mouth. It more certainly acts in this way, provided blood-letting has preceded its exhibition. I have supposed the stimulus from the remote causes of the yellow fever to be equal in force to five, and that of mercury to three. To enable the mercury to produce its action upon the system, it is necessary to reduce the febrile action, by bleeding, to two and a half, or below it, so that the stimulus of the mercury shall transcend it. The safety of mercury, when introduced into the system, has three advantages as a stimulus over that of the matter which produces the fever.

1. It excites an action in the system preternatural only in *force*. It does not derange the *natural* order of actions.
2. It determines the actions chiefly to external parts of the body. And, 3. It fixes them, when it affects the mouth and throat, upon parts which are capable of bearing great inflammation and effusion without any danger to life. The stimulus which produces the yellow fever acts in ways the reverse of those which have been mentioned. It produces violent irregular or wrong actions. It determines them to internal parts of the body, and it fixes them upon viscera which bear, with difficulty and danger, the usual effects of disease. A late French writer, Dr. Fabre, ascribed to diseases a centrifugal, and a centripetal direction. From what has been said it would seem, the former belongs to mercury, and the latter to the yellow fever.

Considering the great prejudices against blood-letting, I have wished to combat this fever with mercury alone. But, for reasons formerly given, I have been afraid to trust to it without the assistance of the lancet. The character of the fever, moreover, like that which the poet has ascribed to Achilles, is of "so swift, irritable, inexorable, and cruel" a nature, that it would be unsafe to rely exclusively upon a medicine which is not only of less

efficacy than bleeding, but often slow and uncertain in its operation, *more especially* upon the throat and mouth.

Let not the reader be offended at my attempts to reason. I am aware of the evils which the weak and perverted exercise of this power of the mind has introduced into medicine. But let us act with the same consistency upon this subject that we do in other things.

We do not consign a child to its cradle for life, because it falls in its first unsuccessful efforts to use its legs. In like manner we must not abandon reason, because, in our first efforts to use it, we have been deceived. A single just principle in our science will lead to more truth, in one year, than whole volumes of uncombined facts will do in a century.

I lost but two patients in this epidemic in whom the mercury excited a salivation. One of them died from the want of nursing; the other by the late application of the remedy.



OF EMETICS.

It was said a practitioner, who was opposed to bleeding and mercury, cured this fever by means of strong emetics. I gave one to a man who refused to be bled. It operated freely, and brought on a plentiful sweat. The next day he arose from his bed and went to his work. On the fourth day he sent for me again. My son visited him, and found him without a pulse. He died the next day.

I heard of two other persons who took emetics in the beginning of the fever, without the advice of a physician, both of whom died.

Dr. Pinckard informed me, that their effects were generally hurtful in the violent grades of the yellow fever in the West-Indies. The same information has since been given to me by Dr. Jackson. In the second and third grades of the bilious fever they appear not only to be safe, but useful.

OF DIET AND DRINKS.

The advantages of a weak vegetable diet were very great in this fever. I found but little difficulty, in most cases, in having my prohibition of animal food complied with before the crisis of the fever, but there was often such a sudden excitement of the appetite for it, immediately afterwards, that it was difficult to restrain it. I have mentioned the case of a young man, who was upon the recovery, who died in consequence of supping-upon beef-stakes. Many other instances of the mortality of this fever from a similar cause, I believe, occurred in our epidemic, which were concealed from our physicians. I am not singular in ascribing the death of convalescents to the too early use of animal food. Dr. Poissonnier has the following important remark upon this subject "The physicians of Brest have observed, that the relapses in the malignant fever, which prevailed in their naval hospitals, were as much the effect of a fault in the diet of the sick as of the contagious air to which they were exposed, and that as many patients perished from this cause as from the original fever. For this reason light soups, with leguminous vegetables in them, panada, rice seasoned with cinnamon, fresh eggs, &c. are all that they should be permitted to eat. The use of flesh should be forbidden for many days after the entire cure of the disorder."*

Dr. Huxham has furnished another evidence of the danger from the premature use of animal food, in his history of a malignant fever which prevailed at Plymouth, in the year 1740 "If any one (says the doctor) made use of a flesh or fish diet, before he had been very well purged, and his recovery confirmed, he infallibly indulged himself herein at the utmost danger of his life."†

In addition to the mild articles of diet, mentioned by Dr. Poissonnier, I found bread and milk, with a little water, sugar, and the pulp of a roasted apple mixed with it, very acceptable to my patients during their convalescence. Oysters were equally innocent and agreeable. Ripe grapes were devoured by them with avidity, in every stage

* *Maladies de Gens de Mer*, vol. i. p. 345.

† *Epidemics*, vol. ii. p. 67.

of the fever. The season had been favourable to the perfection of this pleasant fruit, and all the gardens in the city and neighbourhood in which it was cultivated were gratuitously opened by the citizens for the benefit of the sick.

The drinks were, cold water, toast and water, balm tea, water in which jellies of different kinds had been dissolved, lemonade, apple water, barley and rice water, and, in cases where the stomach was affected with sickness or puking, weak porter and water, and cold camomile tea. In the convalescent stage of the fever, and in such of its remissions or intermissions as were accompanied with great languor in the pulse, wine-whey, porter and water, and brandy and water, were taken with advantage.

Cold water applied to the body, cool and fresh air, and cleanliness, produced their usual good effects in this fever. In the external use of cold water, care was taken to confine it to such cases as were accompanied with preternatural heat, and to forbid it in the cold fit of the fever, and in those cases which were attended with cold hands and feet, and where the disease showed a disposition to terminate, in its first stage, by a profuse perspiration. It has lately given me great pleasure to find the same practice, in the external use of cold water in fevers, recommended by Dr. Currie of Liverpool, in his medical reports of the effects of water, cold and warm, as a remedy in febrile diseases. Of the benefit of fresh air in this fever, Dr. Dawson of Tortola has lately furnished me with a striking instance. He informed me, that by removing patients from the low grounds on that island, where the fever is generated, to a neighbouring mountain, they generally recovered in a few days.

Finding a disagreeable smell to arise from vinegar sprinkled upon the floor, after it had emitted all its acid vapour, I directed the floors of sick rooms to be sprinkled only with water. I found the vapour which arose from it to be more grateful to my patients. A citizen of Philadelphia, whose whole family recovered from the fever, thought he perceived evident advantages from tubs of fresh water being kept constantly in the sick rooms.

OF STIMULATING REMEDIES.

There were now and then remissions and intermissions of the fever, accompanied with such signs of danger from debility, as to render the exhibition of a few drops of laudanum, in a little wine-whey, a glass of brandy and water, and, in some instances, a cup of weak chicken-broth, highly necessary and useful. In addition to these cordial drinks, I directed the feet to be placed in a tub of warm water, which was introduced under the bed-clothes, so that the patient was not weakened by being raised from a horizontal posture. All these remedies were laid aside upon a return of a paroxysm of fever.

I did not prescribe bark in a single case of this disease. An infusion of the quassia root was substituted in its room, in several instances, with advantage.

Blisters were applied as usual, but, from the insensibility of the skin, they were less effectual than applications of mustard to the arms and legs. It is a circumstance worthy of notice, that while the stomach, bowels, and even the large blood-vessels are sometimes in a highly excited state, and overcharged, as it were, with life, the whole surface of the body is in a state of the greatest torpor. To attempt to excite it by internal remedies is like adding fuel to a chimney already on fire. The excitement of the blood-vessels, and the circulation of the blood, can only be equalized by the application of stimulants to the skin. These, to be effectual, should be of the most powerful kind. Caustics might probably be used in such cases with advantage. I am led to this opinion by a fact communicated to me by Dr. Stewart. A lighted candle, which had been left on the bed of a woman whom he was attending in the apparent last stage of the yellow fever, fell upon her breast. She was too insensible to feel, or too weak to remove it. Before her nurse came into her room, it had made a deep and extensive impression upon her flesh. From that time she revived, and in the course of a few days recovered. As a tonic remedy in this fever, Dr. Jackson has spoken to me in high terms of the good effects of riding in a carriage. Patients, he informed me, who were moved with difficulty, after riding a few miles were able to sit up, and

when they returned from their excursions, were frequently able to walk to their beds.

Much has been said, of late years, in favour of the application of warm olive oil to the body in the plague, and a wish has been expressed, by some people, that its efficacy might be tried in the yellow fever. Upon examining the account of this remedy, as published by Mr. Baldwin, three things suggest themselves to our notice. 1. That the oil is effectual only in the *forming* state of the disease; 2. That the friction which is used with it contributes to excite the torpid vessels of the skin; and 3. That it acts chiefly by depleting from the pores of the body. From the unity of the remedy of depletion, it is probable purging or bleeding might be substituted to the expensive parade of the sweat induced by the warm oil, and the smoke of odoriferous vegetables. But I must not conceal here, that there are facts which favour an idea, that oil produces a sedative action upon the blood-vessels, through the medium of the skin. Bontius says it is used in this manner in the East-Indies, for the cure of malignant fevers, after the previous use of bleeding and purging. It seems to have been a remedy well known among the Jews; hence we find the apostle James advises its being applied to the body, in addition to the prayers of the elders of the church.* It is thus in other cases, the blessings of heaven are conveyed to men through the use of natural means.

During the existence of the premonitory symptoms, and before patients were confined to their rooms, a gentle purge, or the loss of a few ounces of blood, in many hundred instances, prevented the formation of the fever. I did not meet with a single exception to this remark.

Fevers are the affliction chiefly of poor people. To prevent or to cure them, remedies must be cheap, and capable of being applied with but little attendance. From the affinity established by the Creator between evil and its antidotes, in other parts of his works, I am disposed to believe no remedy will ever be effectual in any general disease, that is not cheap, and that cannot easily be made universal.

It is to be lamented that the greatest part of all the deaths which occur, are from diseases that are under the power of

medicine. To prevent their fatal issue, it would seem to be agreeable to the order of Heaven in other things, that they should be attacked in their forming state. Weeds, vermin, public oppression, and private vice, are easily eradicated and destroyed, if opposed by their proper remedies, as soon as they show themselves. The principal obstacle to the successful use of the antidotes of malignant fevers, in their early stage, arises from physicians refusing to declare when they appear in a city, and from their practice of calling their mild forms by other names than that of a mortal epidemic.

I shall now say a few words upon the success of the depleting practice in this epidemic.

From the more malignant state of the fever, and from the fears and prejudices that were excited against bleeding and mercury by means of the newspapers, the success of those remedies was much less than in the years 1793 and 1794. Hundreds refused to submit to them at the *time*, and in the *manner*, that were necessary to render them effectual. From the publications of a number of physicians, who used the lancet and mercury in their greatest extent, it appears that they lost but one in ten of all they attended. It was said of several practitioners who were opposed to copious bleeding, that they lost a much smaller proportion of their patients with the prevailing fever. Upon inquiry it appeared they had lost many more. To conceal their want of success, they said their patients had died of other diseases. This mode of deceiving the public began in 1793. The men who used it did not recollect, that it is less in favour of a physician's skill to lose patients in pleurisies, colics, hæmorrhages, contusions, and common remittents, than in a malignant yellow fever.

Dr. Sayre attended fifteen patients in the disease, all of whom recovered by the plentiful use of the depleting remedies. His place of residence being remote from those parts of the city in which the fever prevailed most, prevented his being called to a greater number of cases.

A French physician, who bled and purged *moderately*, candidly acknowledged that he saved but three out of four of his patients.

In the city hospital, where bleeding was sparingly used, and where the physicians depended chiefly upon a saliva-

tion, more than one half died of all the patients who were admitted. It is an act of justice to the physicians of the hospital to add, that many, perhaps most of their patients, were admitted *after* the first day of the disease.

I cannot conclude this comparative view of the success of the different modes of treating the yellow fever, without taking notice, that the stimulating mode as recommended by Dr. Kuhn and Dr. Stevens, in the year 1793, was deserted by every physician in the city. Dr. Stevens acknowledged the disease to require a different treatment from that which is required in the West-Indies; Dr. Kuhn adopted the lancet and mercury in his practice; and several other physicians, who had written against those remedies, or who had doubted of their safety, and efficacy in 1793, used them with confidence, and in the most liberal manner, in 1797.

In the histories I have given of the yellow fevers of 1793 and 1794, I have scattered here and there a few observations upon their degrees of danger, and the signs of their favourable or unfavourable issue. I shall close the present history, by collecting those observations into one view, and adding to them such other signs as have occurred to me in observing this epidemic.

Signs of moderate danger, and a favourable issue of the yellow fever.

1. A chilly fit accompanying the attack of the fever. The longer this chill continues, the more favourable the disease.

2. The recurrence of chills every day, or twice a day, or every other day, with the return of the exacerbations of the fever. A coldness of the whole body, at the above periods, without chills, a coldness with a profuse sweat, cold feet and hands, with febrile heat in other parts of the body, and a profuse sweat without chills or coldness, are all less favourable symptoms than a regular chilly fit, but they indicate less danger than their total absence during the course of the fever.

3. A puking of *green* or *yellow* bile on the first day of the disease is favourable. A discharge of black bile, if it occur on the *first* day of the fever, is not unfavourable.

4. A discharge of green and yellow stools. It is more favourable if the stools are of a dark or black colour, and

of a fœtid and acrid nature, on the first or second day of the fever.

5. A softness or moisture on the skin in the beginning of the fever.

6. A sense of pain in the head, or a sudden translation of pain from internal to external parts of the body, particularly to the back. An increase of pain after bleeding.

7. A sore mouth.

8. A moist white, or a yellow tongue.

9. An early disposition to spit freely, whether excited by nature or the use of mercury.

10. Blood becoming sizy, after having exhibited the usual marks of great morbid action in the blood-vessels.

11. Great and exquisite sensibility in the sense of feeling coming on near the close of the fever.

12. Acute pain in the back and limbs.

13. The appearance of an inflammatory spot on a finger or toe, Dr. H. M'Clen says, is favourable. It appears, the doctor says, as if the cause of the fever had escaped by explosion.

Signs of great danger, and of an unfavourable issue of the yellow fever are,

1. An attack of the fever, suddenly succeeding great terror, anger, or the intemperate use of venery, or strong drink.

2. The first paroxysm coming on without any premonitory symptoms, or a chilly fit.

3. A coldness over the whole body without chills for two or three days.

4. A sleepiness on the first and second days of the fever.

5. Uncommon paleness of the face not induced by blood-letting.

6. Constant or violent vomiting, without any discharge of bile.

7. Obstinate costiveness, or a discharge of natural, or white stools; also quick, watery stools after taking drink.

8. A diarrhœa towards the close of the fever. I lost two patients, in 1797, with this symptom, who had exhibited, a few days before, signs of a recovery. Dr. Pinckard informed me, that it was generally attended with a fatal issue in the yellow fever of the West-Indies. Diemerbroeck

declares, that "scarcely one in a hundred recovered, with this symptom, from the plague."*

9. A suppression of urine. It is most alarming when it is without pain.

10. A discharge of dark coloured and bloody urine.

11. A cold, cool, dry, smooth, or shining skin.

12. The appearance of a yellow colour in the face on the first or second day of the fever.

13. The absence of pain, or a sudden cessation of it, with the common symptoms of great danger.

14. A disposition to faint upon a little motion, and fainting after losing but a few ounces of blood.

15. A watery, glassy, or brilliant eye. A red eye on the fourth or fifth day of the disease. It is more alarming if it become so after having been previously yellow.

16. Imperfect vision, and blindness in the close of the disease.

17. Deafness.

18. A preternatural appetite, more especially in the last stage of the fever.

19. A slow, intermitting, and shattered pulse.

20. Great restlessness, delirium, and long continued coma.

21. A discharge of coffee coloured or black matter from the stomach, after the fourth day of the fever.

22. A smooth red tongue, covered with a lead-coloured crust, while its edges are of a bright red.

23. A dull vacant face, expressive of distress.

24. Great insensibility to common occurrences, and an indifference about the issue of the disease.

25. Uncommon serenity of mind accompanied with an unusually placid countenance.

I shall conclude this head by the following remarks:

1. The violence, danger, and probable issue of this fever, seem to be in proportion to the duration and force of the predisposing and exciting causes. However steady the former are in bringing on debility, and the latter in acting as irritants upon accumulated excitability, yet a knowledge of their duration and force is always useful, not only in forming an opinion of the probable issue of the fever, but in regulating the force of remedies.

2. The signs of danger vary in different years, from the influence of the weather upon the disease.

3. Notwithstanding the signs of the favourable and unfavourable issue of the fever, are in general uniform, when the cure of the disease is committed to nature, or to tonic medicines, yet they are far from being so when the treatment of the fever is taken out of the hands of nature, and attempted by the use of depleting remedies. We often see patients recover with nearly all the unfavourable symptoms that have been mentioned, and we sometimes see them die, with all those that are favourable. The words of Morellus, therefore, which he has applied to the plague, are equally true when applied to the yellow fever. "In the plague, our senses deceive us. Reason deceives us. The aphorisms of Hippocrates deceive us."* An important lesson may be learned from these facts, and that is, never to give a patient over. On the contrary, it is our duty in this, as well as in all other acute diseases, to dispute every inch of ground with death. By means of this practice, which is warranted by science, as well as dictated by humanity, the grave has often been deprived for a while of its prey, and prelude thereby exhibited of that approaching and delightful time foretold by ancient prophets, when the power of medicine over diseases shall be such, as to render old age the only outlet of human life.

* De Feb. Pestilent. cap. v. "Acutorum morborum incertæ admodum, æ fallaces sunt prædictiones."

AN ACCOUNT
OF THE
BILIOUS YELLOW FEVER,
AS IT
APPEARED IN PHILADELPHIA,
IN THE YEAR 1798.

AN ACCOUNT, &c.

THE yellow fever of the year 1797 was succeeded by scarlatina, catarrhs, and bilious pleurisies, in the months of November and December of the same year. The weather favoured the generation of the latter diseases. It became suddenly cold about the middle of November. On the 5th of December, the navigation of the Delaware was obstructed. There was a thaw on the 13th and 14th of this month, but not sufficient to open the river.

In the month of January, 1798, the fevers discovered an uncommon determination to the brain. Four cases of the hydrocephalic state of fever occurred under my care during this month, all of which yielded to depleting remedies. The subjects of this state of fever were Mr. Robert Lewis, and the daughters of Messrs. John Brooks, Andrew Ellicott, and David Maffat.

The weather was variable during the months of February and March. The navigation of the Delaware was not completely opened until the latter end of February. The diseases of these two months were catarrhs and bilious pleurisies. The former were confined chiefly to children, and were cured by gentle pukes, purges of calomel, and blood-letting. The last remedy was employed twice in a child of Isaac Pisso, of six weeks old, and once in a child of Thomas Billington, of three weeks old, with success.

On the 7th of April, I visited Mr. Pollock, lately from the state of Georgia, in consultation with Dr. Physick, in a yellow fever. He died the evening after I saw him, on the third day of his disease.

There was a snow storm on the 16th of April, and the weather was afterwards very cold. Such leaves and blossoms as had appeared, were injured by it.

On the 1st of May, the mercury in Fahrenheit's thermometer rose to 84°. The weather, during the latter part of this month, and in June, was very dry. On the 6th of

June, Dr. Cooper lost a patient in the yellow fever, near the corner of Twelfth and Walnut-streets. Mark Miller died with the same state of fever on the 2d of July. About a dozen cases of a similar nature occurred, under the care of different practitioners, between the 2d and 20th of this month, and all of them in parts of the city remote from Water-street.

On the 19th of July, the weather was so cool as to render winter clothes comfortable. A severe hail storm had occurred, a few days before, in the neighbourhood of Wilmington, in the Delaware state.

On the 21st of the month, the ship Deborah arrived from one of the West-India islands, and discharged her cargo in the city. She was moored afterwards at Kensington, where the foul air which was emitted from her hold produced several cases of yellow fever, near the shores of that village.

In August the disease appeared in nearly every part of the city, and particularly in places where there was the greatest exhalations from foul gutters and common sewers.

In describing the disease, as it appeared this year, I shall take notice of its symptoms as they appeared in the blood-vessels, alimentary canal, the tongue, the nervous system, in the eyes, the lymphatic system, and the blood.

The subjects which furnished the materials for this history were not only private patients, but the poor in the city hospital, who were committed to the care of Dr. Physick and myself, by the board of health.

I. The pulse was, in many cases, less active in the beginning of this fever than in former years. It was seldom preternaturally slow. It resembled the pulse which occurs in the first stage of the common jail fever. Hæmorrhages were common about the fourth and fifth days, and generally from the gums, throat, or stomach.

II. The whole alimentary canal was much affected in most cases. Costiveness and a vomiting were general. The alvine discharges were occasionally green, dark-coloured, black, and natural. The black vomiting was more common this year than in former years, in all the forms of the fever. It was sometimes suspended for several days before death, and hopes were entertained of a recovery of patients in whom it had appeared. In a boy, at the city

hospital, it ceased ten days before he died. It was sometimes succeeded by delirium or coma, but it more commonly left the patient free of pain, and in the possession of all the faculties of his mind.

III. The tongue was by no means an index of the state of the fever, as in the years 1793 and 1797. I saw several deaths, attended with a black vomiting, in which the tongue retained a natural appearance. This phenomenon at first deceived me. I ascribed it to such a concentration of the disease in the stomach and other vital parts, as to prevent its diffusing itself through the external parts of the system. We observe the effects of the same cause in a natural state of the skin, and in a natural appearance of the urine, in the most malignant forms of this fever.

IV. In the nervous system, the disease appeared with several new symptoms. A relation of Peter Field attempted to bite his attendants in the delirium of his fever, just before he died.

I attended a young woman at Mrs. Easby's, who started every time I touched her pulse. Loud talking, or a question suddenly proposed to her, produced the same convulsive motion. She retained her reason during the whole of her illness, and was cured by bleeding and salivation.

Hiccup was a common symptom. I saw but two patients recover who had it. In one of them, Dr. Hedges, it came on after the sixth day of the fever, and continued without any other symptom of disease, for four or five days.

I lost a patient who complained of no pain but in the calves of his legs. Dr. Physick lost a girl, in the city hospital, who complained only of pains in her toes. Her stomach discovered, after death, strong marks of inflammation.

Many people passed through every stage of the disease, without uttering a complaint of pain of any kind.

An uncommon stiffness in the limbs preceded death a few hours, in several cases. This stiffness ceased, in one of Dr. Physick's patients, immediately after death, but returned as soon as he became cold.

An obstinate wakefulness continued through the whole of the disease in Dr. Leib. It was common during the convalescence, in many cases.

The whole body was affected, in many cases, with a morbid sensibility, or what has been called supersensation, so that patients complained of pain upon being touched, when they were moved in their beds. This extreme sensibility was general in parts to which blisters had been applied. It continued through every stage of the disease. Dr. Physick informed me, that he observed it in a man two hours before he died. In this man there was an absence of pulse, and a coldness of his extremities. Upon touching his wrist, he cried out as if he felt great pain.

V. A redness in the eyes was a general symptom. I saw few recoveries where this redness was not removed.

A discharge of matter from one ear relieved Mr. J. C. Warren from a distressing pulsation of the arteries in his head.

VI. Glandular swellings occurred in several instances. Two cases of them came under my notice. They both terminated favourably.

VII. The blood had its usual appearance in this disease. In the yellow fever which prevailed at the same time in Boston, Dr. Rand says the blood was sizzly in but one out of a hundred cases.

The forms of the fever were nearly similar to those which have been described in the year 1797. I saw several cases in which the disease appeared in the form of a tertian fever. In one of them it terminated in death.

The system, in many cases, was prostrated below the point of inflammatory re-action. These were called, by some practitioners, typhous fevers. It was the most dangerous and fatal form of the disease. Its frequent occurrence gave occasion to remark, that our epidemic resembled the yellow fever of the West-Indies, much more than the fevers of 1793 and 1797.

I attended two patients in whom the disease was protracted nearly to the 30th day. They both recovered.

Dr. Francis Sayre informed me, that he saw a child, in which the morbid affection of the wind-pipe, called cynanche trachealis, appeared with all the usual symptoms of yellow fever.

I attended one case in which the force of the disease was weakened, in its first stage, by a profuse hæmorrhage.

from the bowels. This hæmorrhage was followed by a bloody diarrhœa, which continued for four or five weeks.

Persons of all ages and colours were affected by this fever. I saw a case of it in a child of six months old. In the blacks, it was attended with less violence and mortality than in white people. It affected many persons who had previously had it.

The disease was excited by the same causes which excited it in former years. I observed a number of people to be affected by the fever, who lived in solitude in their houses, without doing any business. The system, in these persons, was predisposed to the disease, by the debility induced by ceasing to labour at their former occupations. It was excited in a young man by a fractured leg. He died five days afterwards, with a black vomiting. I observed, in several instances, an interval of four and five days between the debility induced upon the system by a predisposing, and the action of an exciting cause. Dr. Clark says, he has seen an interval of several weeks between the operation of those causes, in the yellow fever, of Dominique. These facts are worthy of notice, as they lead to a protracted use of the means of obviating an attack of the disease.

During my attendance upon the sick, I twice perceived in my system the premonitory signs of the epidemic. Its complete formation was prevented each time by rest, a moderate dose of physic, and a plentiful sweat.

I shall now take notice of the different manner in which patients died of this fever. The detail may be useful, by unfolding new principles in the animal economy, as well as new facts in the history of the disease.

1. The disease terminated in death, in some instances, by means of convulsions.

2. By delirium, which prompted to exertions and actions similar to those which take place in madness.

3. By profuse hæmorrhages from the gums. This occurred in two patients of Dr. Stewart.

4. By an incessant vomiting and hiccup.

5. By extreme pain in the calves of the legs and toes, which, by destroying the excitement of the system, destroyed life.

6. By a total absence of pain. In this way it put an end to the life of Mr. Henry Hill.

7. By a disposition to easy, and apparently natural sleep. I have reason to believe that Mr. Hill encouraged this disposition to sleep, a few hours before he died, under the influence of a belief that he would be refreshed by it. Diemerbroeck says the plague often killed in the same way.

8. The mind was in many cases torpid, where no delirium attended, and death was submitted to with a degree of insensibility, which was often mistaken for fortitude and resignation.

I shall now mention the morbid appearances exhibited by the bodies of persons who died of this fever, as communicated to me by my friend, Dr. Physick; being the result of numerous dissections made by him at the city hospital.

In all of them the stomach was inflamed. The matter which constitutes what is called the *black vomit*, was found in the stomachs of several patients who had not discharged it at any time by vomiting. In some stomachs, he found lines which seemed to separate the living from their dead parts. Those parts, though dead, were not always in a mortified state. They were distinguished from the living parts by a peculiar paleness, and by discovering a weak texture upon being pressed between the fingers. He observed the greatest marks of inflammation in the stomachs of several persons in whom there had been no vomiting, during the whole course of the disease. The brain in a few instances, discovered marks of inflammation. Water was now and then found in its ventricles, but always of its natural colour, even in those persons whose skins were yellow. The liver suffered but little in this disease. It may serve to increase our knowledge of the influence of local circumstances upon epidemics to remark, that this viscus, which was rarely diseased in the fever of Philadelphia in 1798, discovered marks of great inflammation in the bodies which were examined by Dr. Rand and Dr. Warren, in the town of Boston, where the yellow fever prevailed at the same time it did in Philadelphia.

The weather was hot and dry in August and September, during the prevalence of this fever. Its influence upon

animal and vegetable life are worthy of notice. Mosquitoes abounded, as usual in sickly seasons; grasshoppers covered the ground in many places; cabbages and other garden vegetables, and even fields of clover, were devoured by them. Peaches ripened this year three weeks sooner than in ordinary summers, and apples rotted much sooner than usual after being gathered in the autumn. Many fruit-trees blossomed in October, and a second crop of small apples and cherries were seen in November, on the west side of Schuylkill, near the city. Meteors were observed in several places. On the 29th of September there was a white frost. Its effects upon the fever were obvious and general. It declined, in every part of the city, to such a degree as to induce many people to return from the country. In the beginning of October the weather again became warm, and the disease revived. It was observable, that all great changes in the weather from heat to cold that were less than that degree which produces frost, also of cold to heat, increased the mortality of the fever. It spread most rapidly in moist weather.

The origin of this fever was from the exhalations of gutters, docks, cellars, common sewers, ponds of stagnating water, and from the foul air of the ship formerly mentioned.

The fever prevailed at the same time in the town of Chester, in Pennsylvania; in Wilmington, in the state of Delaware; in New-York, in New-London, in Connecticut; in Windsor, in Vermont; and in Boston; in all which places its origin was traced to domestic sources.

I shall now deliver a short account of the remedies employed in the cure of this disease.

I have said that the pulse was less active in this fever than in the fevers of former years. It was seldom, however, so feeble as to forbid bleeding. In Dr. Mease it called for the loss of 162 ounces of blood, and in Mr. J. C. Warren for the loss of 200, by successive bleedings, before it was subdued. But such cases were not common. In most of them, the pulse flagged after two or three bleedings. But there were cases in which the lancet was forbidden altogether. In these the system appeared to be prostrated, by the force of the miasmata, below the point of re-action. This state of the disease manifested itself in

a weak, quick, and frequent pulse, languid eye, sighing, great inquietude, or great insensibility. However unsafe bleeding was on the first day of this fever, when it appeared with those symptoms, nature often performed that operation upon herself from the gums, on the fourth or fifth day. I saw several pounds of blood discharged on those days, and in that way, with the happiest effects. It appeared to take place after the revival of the blood-vessels from their prostrated state.

From a conviction that the system was depressed only in these cases, and finding that it did not rise upon blood-letting, I resolved to try the effects of emetics, in exciting and equalizing the action of the blood-vessels. The experience I had had of the inefficacy of this remedy in 1793, and of its ill effects in one instance in 1797, led me to exhibit it with a trembling hand. I gave it for the first time to a son of Richard Renshaw. I had bled him but once, and had in vain tried to bring on a salivation. On the fifth day of his disease, his pulse became languid and slow, his skin cool, a hæmorrhage had taken place from his gums, and he discovered a restlessness and anxiety which I had often seen, a few hours before death. He took four grains of tartar emetic, with twenty grains of calomel, at two doses. They operated powerfully, upwards and downwards, and brought away a large quantity of bile. The effects of this medicine were such as I wished. The next day he was out of danger. I prescribed the same medicine in many other cases with the same success. To several of my patients I gave two emetics in the course of the disease. Some of them discharged bile resembling in viscosity the white of an egg. But I saw one case in which great relief was obtained from the operation of an emetic, where no bile was discharged.

In the exhibition of this remedy, I was regulated by the pulse. If I found it languid on the first day of the fever, I gave it before any other medicine. When it was full and tense, I deferred it until I had reduced the pulse to the emetic point by bleeding and purges. I observed, with great pleasure, that mercury affected the mouth more speedily and certainly where an emetic had been administered, than in other cases, probably from awakening, by its stimulus, the sensibility of the stomach; for such was

its torpor, that in one case ten grains of tartar emetic, and in another thirty grains, did not operate upon it, so as to excite even the slightest degree of nausea.

In many cases, an emetic, given in the forming state of the disease, seemed to effect an immediate cure.

Purges produced the same salutary effects that they did in former years. I always combined calomel with them in the first stage of the disease.

A salivation was found to be the most certain remedy of any that was used in this fever. I did not lose a single patient, in whom the mercury acted upon the salivary glands. It was difficult to excite it in many cases, from the mercury being rejected by the stomach, from its passing off by the bowels, or from its stimulus being exceeded by the morbid action in the blood-vessels.

Bleeding rendered the action of the mercury upon the mouth more speedy and more certain, but I saw several cases in which a salivation was excited in the most malignant forms of the fever, where no blood had been drawn. It will not be difficult to explain the reason of this fact if we recur to what was said formerly of the prostration of the system in this fever. In its worst forms, there is often a total absence, or a feeble degree of action in the blood-vessels, from an excess of the stimulus of the remote cause of the fever. Here the mercury meets with no resistance in its tendency to the mouth. Bleeding in this case would probably do harm, by taking off a part of the pressure upon the system, and thereby produce a re-action in the vessels, that might predominate over the action of the mercury. The disease here does that for us by its force, which, in other cases, we effect by depleting remedies.

Where the mercury showed a disposition to pass too rapidly through the bowels, I observed no inconvenience from combining it with opium, in my attempts to excite a salivation. The calomel was constantly aided by mercurial ointment, applied by friction to different parts of the body.

Now and then a salivation continued for weeks and months after the crisis of this fever, to the great distress of the patient, and injury of the credit of mercury as a remedy in this disease. Dr. Physick has discovered, that in these

cases the salivation is kept up by carious teeth or bone, and that it is to be cured only by removing them.

From the impracticability of exciting a salivation in all cases, I attempted the cure of this fever, after bleeding, by means of copious sweats. They succeeded in several instances where no other remedy promised or afforded any relief. They were excited by wrapping the patient in a blanket, with half a dozen hot bricks wetted with vinegar, and applied to different parts of the body. The sweating was continued for six hours, and repeated daily for four or five days.

In those cases where the fever put on the form of an intermittent, I gave bark after bleeding and purging with advantage. I gave it likewise in all those cases where the fever put on the type of the slow chronic fever. Laudanum was acceptable and useful in many cases of pain, wakefulness, vomiting, and diarrhœa, after the use of depleting remedies.

I applied *blisters* in the usual way in this fever, but I think with less effect than in the yellow fevers of former years.

To relieve a vomiting, which was very distressing in many cases about the fourth and fifth days, I gave a julep, composed of the salt of tartar and laudanum. I also gave Dr. Hosack's anti-emetic medicine, composed of equal parts of lime-water and milk. I do not know that it saved any lives, but I am sure it gave ease by removing a painful symptom, and thus, where it did not cure, lessened the sufferings of the sick.

The diet and drinks were the same in this fever as they were in the fevers formerly described.

Cool air, cold water, and cleanliness produced their usual salutary effects in this fever.

I shall now deliver a short account of the symptoms which indicated a favourable and an unfavourable issue of the disease.

It has been said,* that the signs of danger vary in this fever, from the influence of the weather. The autumn of 1798 confirmed, in many instances, the truth of this remark.

* History of the Fever in 1797.

I saw three recoveries after convulsions in the year 1798. All died who were convulsed in 1793 and 1797.

A dry, hoarse, and sore throat was followed by death in every case in which it occurred in my practice. In the fever of 1793 a sore throat was a favourable sign. It was one of the circumstances which determined me to use a salivation in that fever.

The absence of pain was always a bad sign. Small but frequent stools, and a continuance of a redness in the eyes after the ample use of depleting remedies, were likewise bad signs.

An appetite for food on the fourth or fifth day of the fever, without a remission or cessation of the fever, was always unfavourable.

A want of delicacy, in exposing parts of the body which are usually covered, was a bad symptom. I saw but one recovery where it took place. Boccacio says the same symptom occurred in the plague in Italy. "It suspended (he tells us) all modesty, so that young women, of great rank and delicacy, submitted to be attended, dressed, and even cleansed by male nurses.

I have remarked, in another place, that but two of my patients recovered who had the hiccup.

A dry tongue was a bad sign. I saw but one recovery where it occurred, and none where the tongue was black. A moist and natural tongue, where symptoms of violence or malignity appeared in other parts of the body, was always followed by a fatal issue of the disease.

A desire to ride out, or to go home, in persons who were absent from their families, was in every instance where it took place, a fatal symptom. These desires arose from an insensibility to pain, or a false idea of the state of the disease. It existed to such a degree in some of the patients in the city hospital, that they often left their beds, and dressed themselves, in order to go home. All these patients died, and some of them in the act of putting on their clothes.

From the history that has been given of the symptoms, treatment, and prognosis of this fever, we see how imperfect all treatises on epidemics must be, which are not connected with climate and season. As well might a tra-

veller describe a foreign climate, by the state of the weather, or by the productions of the earth, during a single autumn, as a physician adopt a uniform opinion of the history, treatment, and prognosis of a fever, from its phenomena in any one country, or during a single season.

There were three modes of practice used in this epidemic. The first consisted in the exhibition of purges of castor oil, salts, and manna, and cooling glysters, and in the use of the warm bath. These remedies were prescribed chiefly by the French physicians. The second consisted in the use of mercury alone, in such doses, and in such a manner, as to excite a salivation. This mode was used chiefly by an itinerant and popular quack. The third mode consisted in using all the remedies which I have mentioned in the account of the treatment of this fever, and accommodating them to the state of the disease. This mode of practice was followed by most of the American physicians.

The first mode of practice was the least successful. It succeeded only in such cases as would probably have cured themselves.

The second mode succeeded in mild cases, and now and then in that malignant state of the fever, in which the action of the blood-vessels was so much prostrated by the force of the miasmata, as to permit the mercury to pass over them, and thus to act upon the salivary glands in the course of four or five days.

The last mode was by far the most successful. It is worthy of notice, that the business and reputation of the physicians, during this epidemic, were in the inverse ratio of their success. The number of deaths by it amounted to between three and four thousand, among whom were three physicians, and two students of medicine. Its mortality was nearly as great as it was in 1793, and yet the number of people who were affected by it was four times as great in 1793 as it was in 1798, for, in the latter year, the city was deserted by nearly all its inhabitants. The cause of this disproportion of deaths to the number who were sick, was owing to the liberal and general use of the lancet in 1793, and to the publications in 1797 having excited general fears and prejudices against it in 1798.

Such was the influence of these publications, that many persons who had recovered from this fever in the two former years, by the use of depleting remedies, deserted the physicians who had prescribed them, and put themselves under the care of physicians of opposite modes of practice. Most of them died. Two of them had been my patients, one of whom had recovered of a third attack of the fever under my care.

AN ACCOUNT
OF THE
BILIOUS YELLOW FEVER,
AS IT
APPEARED IN PHILADELPHIA,
IN THE YEAR 1799.

AN ACCOUNT, &c.

THE diseases which succeeded the fever of 1798, in November and December, were highly inflammatory. A catarrh was nearly universal. Several cases of sore throat, and one of erysipelas, came under my care in the month of November. The weather in December was extremely cold. It was equally so in the beginning of January, 1799, accompanied with several falls of snow.

About the middle of the month, the weather moderated so much as to open the navigation of the Delaware. I met with two cases of malignant cholic in the latter part of this month, and one of yellow fever. The last was Swen Warner. Dr. Physick, who attended him with me, informed me that he had, nearly at the same time, attended two other persons with the same disease.

The weather was very cold, and bilious pleurisies were common, during the latter part of the month of February.

March was equally cold. The newspapers contained accounts of the winter having been uncommonly severe in Canada, and in several European countries.

The first two weeks in April were still cold. The Delaware, which had been frozen a second time during the winter, was crossed near its origin, on the ice, on the 15th day of this month. The diseases, though fewer than in the winter, were bilious and inflammatory. During this month I was called to a case of yellow fever, which yielded to copious bleeding, and other depleting medicines.

May was colder than is usual in that month, but very healthy.

In the first week of June, several cases of highly bilious fever came under my care. In one of them, all the usual symptoms of the highest grade of that fever occurred. On the 13th of the month, Dr. Physick informed me, that he had lost a patient with that disease. On the 23d of the same month, Joseph Ashmead, a young merchant, died of it. Several other cases of the disease occurred between

the 20th and 29th days of the month, in different parts of the city. About this time, I was informed that the inhabitants of Keys's-alley had predicted a return of the yellow fever, from the trees before their doors emitting a smell, exactly the same which they perceived just before the breaking out of that disease in 1793.

In July, the city was alarmed, by Dr. Griffiths, with an account of several cases of the fever in Penn-street, near the water. The strictness with which the quarantine law had been executed, for a while rendered this account incredible with many people, and exposed the doctor to a good deal of obloquy. At length a vessel was discovered, that had arrived from one of the West-India islands on the 14th of May, and one day before the quarantine law was put into operation, from which the disease was said to be derived. Upon investigating the state of this vessel, it appeared that she had arrived with a healthy crew, and that no person had been sick on board of her during her voyage.

In the latter part of July and in the beginning of August, the disease gradually disappeared from every part of the city. This circumstance deserves attention, as it shows the disease did not spread by contagion.

About this time we were informed by the news-papers, that dogs, geese and other poultry, also that wild pigeons were sickly in many parts of the country, and that fish on the Susquehannah, and oysters in the Delaware bay, were so unpleasant that the inhabitants declined eating them. At the same time, flies were found dead in great numbers, in the unhealthy parts of the city. The weather was dry in August and September. There was no second crop of grass. The gardens yielded a scanty supply of vegetables, and of an inferior size and quality. Cherries were smaller than usual, and pear and apple-trees dropped their fruits prematurely, in large quantities. The peaches, which arrived at maturity, were small and ill tasted. The grain was in general abundant, and of a good quality. A fly, of an unusual kind, covered the potatoe fields, and devoured in some instances, the leaves of the potatoe. This fly has lately been used with success in our country, instead of the fly imported from Spain. It is equal to it in every respect. Like the Spanish fly, it sometimes induces strangury.

About the middle of August the disease revived, and appeared in different parts of the city. A publication from the academy of medicine, in which they declared the seeds of the disease to spread from the atmosphere only, produced a sudden flight of the inhabitants. In no year, since the prevalence of the fever, was the desertion of the city so general.

I shall now add a short account of the symptoms and treatment of this epidemic.

The arterial system was in most cases active. I met with a tense pulse in a patient after the appearance of the black vomiting. Delirium was less frequent in adults than in former years. In children there was a great determination of the disease to the brain.

I observed no new symptoms in the stomach and bowels. One of the worst cases of the fever which I saw was accompanied with cholic. A girl of Thomas Shortall, who recovered, discharged nine worms during her fever. It appeared in Mr. Thomas Roane, one of my pupils, in the form of a dysentery.

A stiffness, such as follows death, occurred in several patients in the city hospital before death.

Miss Shortall had an irruption of pimples on her breast, such as I have described in a short account I gave of the yellow fever of 1762 in this city, in my account of the disease in 1793.

The blood exhibited its usual appearances in the yellow fever. It was seldom sizy till towards the close of the disease.

The tongue was generally whitish. Sometimes it was of a red colour, and had a polished appearance. I saw no case of a black tongue, and but few that were yellow before the seventh day of the disease.

The type of this disease was nearly the same as described in 1797. It now and then appeared in the form of a quartan, in which state it generally proved fatal. It appeared with rheumatic pains in one of my patients. It blended itself with gout and small-pox. Its union with the latter disease was evident in two patients in the city hospital, in each of whom the stools were such as were discharged in the most malignant state of the fever.

The remedies for this fever were bleeding, vomits, purges, sweats, and a salivation and blisters.

There were few cases that did not indicate bleeding. It was performed, when proper, in the usual way, and with its usual good effects. It was indicated as much when the disease appeared in the bowels as in the blood-vessels. Mr. Roane, in whom it was accompanied with symptoms of dysentery, lost nearly 200 ounces of blood by twenty-two bleedings.

I found the same benefit from emetics, in this fever, that I did in the fever of 1798. They were never administered except on the first day, before violent action had taken place in the system, or after it was moderated by one or two bleedings.

Purges of calomel and jalap, also castor oil, salts, and injections, were prescribed with their usual advantages.

In those cases where the system was prostrated below the point of re-action, I began the cure by sweating. Blankets, with hot bricks wetted with vinegar, and the hot bath, as mentioned formerly, when practicable, were used for this purpose. The latter produced, in a boy of 14 years of age, who came into the city hospital without a pulse, and with a cold skin, in a few hours, a general warmth and an active pulse. The determination of the disease to the pores was evinced in one of my patients, by her sweating under the use of the above-mentioned remedies, for the first time in her life. A moisture upon her skin had never before been induced, she informed me, even by the warmest day in summer.

The advantages of a salivation were as great as in former years. From the efficacy of bleeding, purges, emetics, and sweating, I had the pleasure of seeing many recoveries before the mercury had time to affect the mouth. In no one case did I rest the cure exclusively upon any one of these remedies. The more numerous the outlets were to convey off superfluous fluids and excitement from the body, the more safe and certain were the recoveries. A vein, the gall-bladder, the bowels, the pores, and the salivary glands, were all opened, in succession, in part, or together, according to circumstances, so as to give the disease every possible chance of passing out of the body without injuring or destroying any of its vital parts.

Blisters were applied with advantage. The vomiting and sickness which attend this fever were relieved in many instances, by a blister to the stomach.

In those cases in which the fever was protracted to the chronic state, bark, wine, laudanum, and æther produced the most salutary effects. I think I saw life recalled, in several cases in which it appeared to be departing by frequent and liberal doses of the last of those medicines. The bark was given, with safety and advantage, after the seventh day, when the fever assumed the form of an intermittent.

The following symptoms were generally favourable, viz. a bleeding from the mouth and gums, and a disposition to weep, when spoken to in any stage of the fever.

A hoarseness and sore throat indicated a fatal issue of the disease, as it did in 1798. Dr. Physick remarked, that all those persons who sighed after waking suddenly, before they were able to speak, died.

The recurrence of a redness of the eyes, after it had disappeared, or of but one eye, was generally followed by death. I saw but one recovery with a red face.

I saw several persons, a few hours before death, in whom the countenance, tongue, voice, and pulse were perfectly natural. They complained of no pain, and discovered no distress nor solicitude of mind. Their danger was only to be known by the circumstances which had preceded this apparently healthy and tranquil state of the system. They had all passed through extreme suffering, and some of them had puked black matter.

The success of the mode of practice I have described was the same as in former years, in private families; but in the city hospital, which was again placed under the care of Dr. Physick and myself, there was a very different issue to it, from causes which are too obvious to be mentioned.

There were two opinions given to the public upon the subject of the origin of this fever; the one by the academy of medicine, the other by the college of physicians. The former declared it to be generated in the city, from putrid domestic exhalations, because they saw it only in their vicinity, and discovered no channel by which it could have been derived from a foreign country; the latter asserted it to be "imported, because it had been imported in former years."

AN
ACCOUNT OF SPORADIC CASES
OF
YELLOW FEVER,
AS THEY
APPEARED IN PHILADELPHIA,
IN 1800.

AN ACCOUNT, &c.

THE weather in the month of January was less cold than is common in that month. Catarrhs, the cynanche trachealis, and bilious pleurisies, were prevalent in every part of it. A few cases of yellow fever occurred likewise during this month.

Several cases of erysipelas appeared in February.

The month of March was unusually healthy.

The weather was warm in April, and the city as healthy as in March.

It was equally so in May and June. The spring fruits appeared early in the latter month, in large quantities, and were of an excellent quality. Locusts were universal in June. They had not appeared since the year 1783. A record from the journal of the Swedish missionaries was published at this time, which described their appearance in 1715, in which year it was said to be very healthy.

On the 14th of June there was a severe thunder gust with more lightning than had been known for seven years before.

There fell, during all the months that have been mentioned, frequent and plentiful showers of rain, which rendered the crops of grass luxuriant in the neighbourhood of Philadelphia.

The winds at this time were chiefly from the south-east.

A few intermittents appeared in June, which yielded readily to the bark.

On the 16th day of June, Dr. Physick informed me he had a black boy under his care with the yellow fever.

In July, the hooping cough, cholera infantum, and

some cases of dysentery and bilious fever appeared in the city.

On the 30th of July, Dr. Pascalis informed me that he had lost a patient on the fifth day of a yellow fever.

In August, the dysentery was the principal form of disease that prevailed in the city.

On the 23d of this month a woman died of the yellow fever in Gaskill-street, under the care of Dr. Church.

On the 28th and 30th, there fell an unusual quantity of rain. The winds were south-west and north-west during the greatest part of the summer months. The latter was sometimes accompanied with rain.

On the 11th of September, a clerk of Mr. Levi Hollingsworth, and, on the 12th, a clerk of Mr. John Connelly, died with the yellow fever.

A plentiful shower of rain fell on the night of the 21st of this month.

About this time there appeared one and twenty cases of yellow fever in Spruce-street, between Front and Second-streets. They were all in the neighbourhood of putrid exhalations. Fourteen of them ended fatally.

No one of the above cases of malignant fever could be traced to a ship, or to a direct or indirect intercourse with persons affected with that disease.

While Philadelphia was thus visited by a few sporadic cases only of yellow fever, it was epidemic in several of the cities of the United States, particularly in New-York, Providence, in Rhode Island, Norfolk, and Baltimore. In the last named place, it was publicly declared by a committee of health to be of domestic origin.

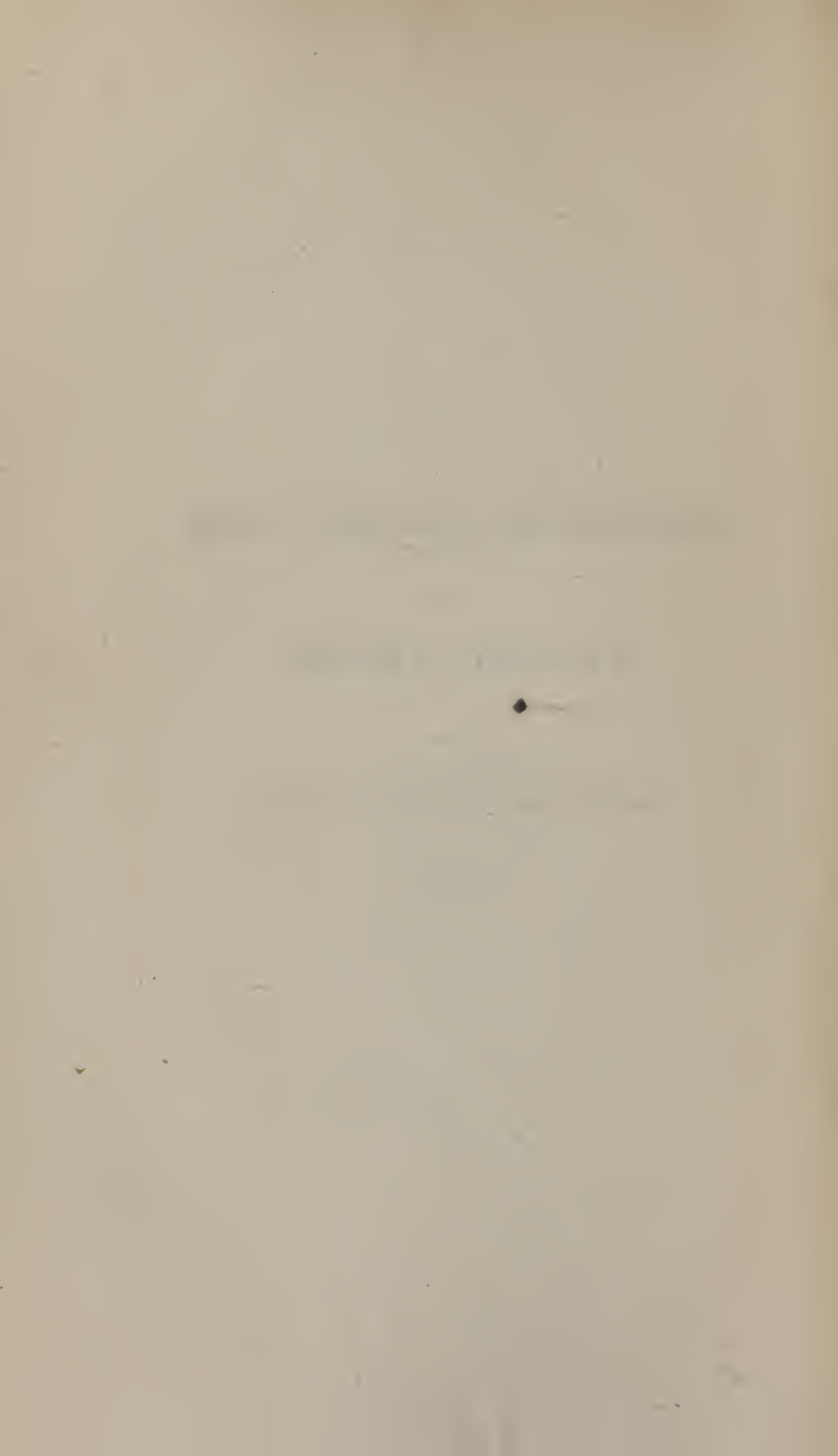
The dysentery was epidemic, at the same time, in several of the towns of Massachusetts and New-Hampshire. It was attended with uncommon mortality at Hanover, in the latter state.

This difference in the states of health and sickness in the different parts of the United States, must be sought for chiefly in the different states of the weather in those places. The exemption of Philadelphia from the yellow fever, as an epidemic, may perhaps be ascribed to the strength and vigour of the vegetable products of the year, which retarded their putrefaction; to frequent showers of rain, which

washed away the filth of the streets and gutters; and to the perfection of the summer and autumnal fruits.

The months of November and December this year were uncommonly healthy. During the former, several light shocks of earthquakes were felt in Lancaster and Harrisburgh, in Pennsylvania, and in Wilmington, in the state of Delaware.

AN
ACCOUNT OF SPORADIC CASES
OF
YELLOW FEVER,
AS THEY
APPEARED IN PHILADELPHIA,
IN 1801.



AN ACCOUNT, &c.

THE month of January was intensely cold. In February it became more moderate. The diseases, during these two months, were catarrhs and a few pleurisies.

In March and April there fell an unusual quantity of rain. The hay harvest began in the neighbourhood of Philadelphia on the 28th of May. A few mild cases of scarlatina anginosa occurred during these months.

In June the weather was dry and healthy.

On the 8th of July, a case of yellow fever occurred in the practice of Dr Stewart. About the 15th of the month, a patient died with it in the Pennsylvania hospital. Dr. Physick informed me that he had, at the same time, two patients under his care with that disease. Several cases of the measles appeared in the south end of the city during this month. In every part of it, the weather was warm and dry, in consequence of which there were no second crops of grass, and a smaller quantity than usual of summer fruits and vegetables. The winds were less steady than they had been for seven years. They blew, every two or three days, from nearly every point of the compass.

On the 4th of August there fell a considerable quantity of rain, which was succeeded by cool and pleasant weather. The cholera morbus was a frequent disease among both adults and children in the city, and the dysentery in several of the adjoining counties of the state.

A number of emigrant families arrived this month from Ireland and Wales, who brought with them the ship fever. They were carefully attended, at the lazaretto and the city hospital, in airy rooms, by which means they did not propagate the disease. Contrary to its usual character, it partook of the remissions of the bilious fever, probably from the influence of the season upon it.

In September there were a few extremely warm days. In the beginning and middle of the month a number of

mild remittents occurred, and about the 22d there were five or six cases of yellow fever in Eighth-street, between Chesnut and Walnut-streets, in two houses ill ventilated, and exposed to a good deal of exhalation. I attended most of these cases in consultation with Dr. Gallaher. One of the persons who was affected with this fever puked black matter while I sat by his bed-side, a few hours before he died.

During the summer and autumn of this year, a number of cases of yellow fever appeared at New-Bedford, Portland, and Norwich, in the New-England states; in New-York; in some parts of New-Jersey; and in Northampton and Bucks counties, in Pennsylvania. It prevailed so generally in New-York, as to produce a considerable desertion of the city. In none of the above places could the least proof be adduced of the disease being imported. In Philadelphia its existence was doubted or denied by most of the citizens, because it appeared in situations remote from the water, and of course could not be derived from any foreign source.

It will be difficult to tell why the fever appeared only in sporadic cases in Philadelphia. Perhaps its prevalence as an epidemic was prevented by the plentiful rains in the spring months, by the absence of moisture from the filth of the streets and gutters, in consequence of the dry weather in June and July, by the vigour and perfection of the products of the earth, and by the variable state of the winds in the month of July. If none of these causes defended the city from more numerous cases of the yellow fever, it must be resolved into the want of a concurring inflammatory constitution of the atmosphere with the common impure sources of that disease.

On the 12th of November, about twelve o'clock in the night, an earthquake was felt in Philadelphia, attended with a noise as if something heavy had fallen upon a floor. Several cases of scarlet fever appeared in December, but the prevailing disease, during the two last autumnal and the first winter months, was the measles. I have taken notice that it appeared in the south end of the city in July. During the months of August and September it was stationary, but in October, November and December it spread through every part of the city. The following circumstances occurred in this epidemic, as far as it came under my notice,

AN ACCOUNT
OF
THE MEASLES,
AS THEY
APPEARED IN PHILADELPHIA,
IN THE YEAR 1801.

AN ACCOUNT, &c.

I. THE disease wore the livery of the autumnal fever in the following particulars.

It was strongly marked by remissions and intermissions. The exacerbations came on chiefly at night.

There were in many cases a constant nausea, and discharge of bile by puking.

I saw one case in which the disease appeared with a violent cholera morbus, and several in which it was accompanied with diarrhœa and dysentery.

II. Many severe cases of phrenzy, and two of cynanche trachealis appeared with the measles.

III. A distressing sore mouth followed them, in a child of two years old, that came under my care.

IV. A fatal hydrocephalus internus followed them in a boy of eight years old, whom I saw two days before he died.

V. I met with a few cases in which the fever and eruption came on in the same day, but I saw one case in which the eruption did not take place until the tenth, and another, in which it did not appear until the fourteenth day after the fever.

VI. Two children had pustules on their skins, resembling the small-pox, before the eruption of the measles.

VII. Many children had coughs and watery eyes, but without the measles. The same children had them two or three weeks afterwards.

VIII. Many people who had had the measles, had coughs during the prevalence of the measles, resembling the cough which occurs in that disease.

The remedies made use of in my practice were,

1. Bleeding, from four to sixty ounces, according to the age of the patient, and the state of the pulse. This

remedy relieved the cough, eased the pains in the head, and in one case produced, when used a third time, an immediate eruption of the measles.

2. Lenient purges.

3. Demulcent drinks.

4. Opiates at night.

5 Blisters. And,

6. Astringent medicines where a diarrhœa took place.

I saw evident advantages from advising a vegetable diet to many children, as soon as any one of the families to which they belonged were attacked by the measles.

I lost but one patient in this disease, and that was a child in convulsions. I ascribed my success to bleeding more generally and more copiously than I had been accustomed to do in the measles of former years.

AN ACCOUNT
OF THE
BILIOUS YELLOW FEVER,
AS IT
APPEARED IN PHILADELPHIA,
IN THE YEAR 1802.

AN ACCOUNT, &c.

THE weather during the month of January was unusually moderate and pleasant. In the latter end of it, many shrubs put forth leaves and blossomed. I saw a leaf of the honeysuckle, which was more than an inch in length, and above half an inch in breadth. There was but one fall of snow, and that a light one, during the whole month.

The winds blew chiefly from the south-west in February. There was a light fall of snow on the 6th. A shad was caught in the Delaware, near the city, on the 17th. On the 18th and 19th of the month, the weather became suddenly very cold. On the 22d there was a snow storm, and on the 28th, rain and a general thaw.

In March, the weather was wet, cold, and stormy, with the exception of a few pleasant days.

The scarlatina anginosa and the cynanche trachealis were the principal diseases that prevailed during the three months that have been mentioned.

In April, there were several frosts, which destroyed the blossoms of the peach-trees.

In May, the weather was so cool as to make fires agreeable to the last day of the month. The wind blew chiefly, during the whole of it, from the north-east.

The scarlatina continued to be the reigning disease. I saw one fatal case of it, in which a redness only, without any ulcers or sloughs, appeared in the throat; and I attended another, in which a total immobility in the limbs was substituted by nature for the pain and swellings in those parts which generally attend the disease. There were three distinct grades of this epidemic. It was attended with such inflammatory or malignant symptoms, in some

instances, as to require two or three bleedings; in others it appeared with a typhoid pulse, which yielded to emetics: turbith mineral was preferred for this purpose; while a redness, without a fever, which yielded to a single purge, was the only symptom of it in many people.

The weather was cool, rainy, and hot, in succession, in the month of June. The scarlatina continued to be the prevailing disease.

During the first and second weeks in July, there fell a good deal of rain. On the 4th of the month I was called to visit Mrs. Harris, in Front-street, between Arch and Market-streets, with a bilious fever. The scarlatina had imparted to it a general redness on her skin, which induced her to believe it was that disease, and to neglect sending for medical relief for several days. She died on the 13th of the month, with a red eye, a black tongue, hiccup, and a yellow skin. Three other cases of malignant bilious fever occurred this month. Two of them were attended by Dr. Dewees and Dr. Otto.

On the 15th of the month, the city was alarmed by an account of this fever having appeared near the corners of Front and Vine-streets, a part of the city which had for many weeks before been complained of by many people for emitting a foetid smell, derived from a great quantity of filthy matters stagnating in that neighbourhood, and from the foul air discharged from a vessel called the *Esperanza*, which lay at Vine-street wharf.

On the 2d of August, it appeared in other parts of the city, particularly in Front and Water-streets, near the drawbridge, where it evidently originated from putrid sources. Reports were circulated that it was derived from contagion, conveyed to Vine-street wharf in the timbers of a vessel called the *St. Domingo Packet*, but faithful and accurate inquiries proved that this vessel had been detained one and twenty days, and well cleaned at the lazaretto, and that no one, of fourteen men who had worked on board of her afterwards, had been affected with sickness of any kind.

On the 5th of August, the board of health publicly declared the fever to be contagious, and advised an immediate desertion of the city. The advice was followed with uncommon degrees of terror and precipitation.

The disease continued, in different parts of the city, during the whole of August and September. On the 5th of October, the citizens were publicly invited from the country by the board of health.

During this season, the yellow fever was epidemic in Baltimore and Wilmington. In the former place it was admitted by their board of health, and in the latter it was proved by Dr. Vaughan, to be of domestic origin. It prevailed, at the same time, in Sussex county and near Woodbury, in New Jersey. Sporadic cases of it likewise occurred in New-York and Boston, and in Port-mouth, in New-Hampshire. The chronic fever, was epidemic in several of the towns of North-Carolina; cases of fever, which terminated in swelling and mortification of the legs, and in death on the third day, appeared on the waters of the Juniata, in Pennsylvania; and bilious fevers, of a highly inflammatory grade, were likewise common near Germantown and Frankford, in the neighbourhood of Philadelphia.

But few of the cases of yellow fever which have been mentioned came under my care, but I saw a considerable number of fevers of a less violent grade. They were the inflammatory, bilious, mild remitting, chronic, and intermitting fevers, and the febricula. They appeared, in some instances, distinct from each other, but they generally blended their symptoms in their different stages. The yellow fever often came on in the mild form of an intermittent, and even a febricula, and as often, after a single paroxysm, ended in a mild remittent or chronic fever. When it appeared in the latter form, it was frequently attended with a slow or low pulse, and a vomiting and hiccup, such as attended in the yellow fever. This diversity of symptoms, with which the summer and autumnal fever came on, made it impossible to decide upon its type on the day of its attack. Having been deceived in one instance, I made it a practice afterwards to watch every case I was called to with double vigilance, lest it should contract a malignant form in my hands, without my being prepared to meet it. Of the five original and obvious cases of yellow fever to which I was called, I saved none, for I saw but one of them before

the last stage of the disease. In many others I have reason to believe I prevented that malignant form of fever, by the early and liberal use of depleting medicines. The practice of those physicians who attended most of the persons who had the yellow fever, was much less successful than in our former epidemics. I suspected at the time, and I was convinced afterwards, that it was occasioned by relying exclusively upon bleeding, purges, and mercury. The skin, in several of the cases which I saw, was covered with moisture. This clearly pointed out nature's attempt to relieve herself by sweating. Upon my mentioning this fact to the late Dr. Pfeiffer, jun. he instantly adopted my opinion, and informed me, as a reason for doing so, that he had heard of several whole families in the Northern Liberties, where the disease prevailed most, who, by attacking it in its forming state by profuse sweats, had cured themselves, without the advice of a physician.

AN ACCOUNT
OF THE
BILIOUS YELLOW FEVER,
AS IT
APPEARED IN PHILADELPHIA,
IN THE YEAR 1803.

AN ACCOUNT, &c.

THE weather in January was uniformly cold. On the 21st of the month, the Delaware was completely frozen.

On the 4th of February there was a general thaw, attended with a storm of hail, thunder, and lightning, which lasted about three quarters of an hour. The diseases of both these winter months were catarrhs and bilious pleurisies. The latter appeared in a tertian type. The pain in the side was most sensible every other day.

The weather was cold and dry in March, in consequence of which vegetation was unusually backward in April. The hooping cough, catarrhs and scarlatina were the diseases of this month.

The beginning of May was very cool. There was ice on the 7th of the month. The winds during the greatest parts of this and the previous month, were from the north-east.

In June, the weather was cool. Intermittents were common in this month, as well as in May. Such was the predominance of this type of fever over all other diseases, that it appeared in the form of profuse sweats, every other night, in a lady under the care of Dr. Dewees and myself, in the puerperile, without the least moisture on her skin. There were a few choleras this month. During the latter end of the month, I lost a patient with many of the symptoms of yellow fever.

The weather in July was alternately hot, moderate, and cool, with but little rain. The first two weeks of this month were healthy. A few tertian fevers occurred, which readily yielded to bark, without previous bleeding. Between the 25th and 31st of the month, three deaths took place from the yellow fever.

In the month of August, the weather was the same as in July, except that there fell more rain in it. Mild remittents and cholera infantum were now common. There were likewise several cases of yellow fever during this month. One of them was in Fromberger's-court. It was induced by the fætor of putrid fish in a cellar. A malignant dysentery was epidemic during this month in the upper part of Germantown, and in its neighbourhood. Several persons, Dr. Bensell informed me, died of it in thirty hours' sickness. It prevailed, at the same time, in many parts of the New-England states.

In September, cases of yellow fever appeared in different parts of the city, but chiefly in Water near Walnut-street. On the 12th of the month, the board of health published a declaration of its existence in the city, but said it was not contagious. This opinion gave great offence, for it was generally said to have been imported by means of a packet boat from New-York, where the fever then prevailed, because a man had sickened and died in the neighbourhood of the wharf where this packet was moored. It was to no purpose to oppose to this belief, proofs that no sick person, and no goods supposed to be infected, had arrived in this boat, and that no one of three men, who had received the seeds of the disease in New-York, had communicated it to any one of the families in Philadelphia, in which they had sickened and died.

The disease assumed a new character this year, and was cured by a different force of medicine from that which was employed in some of the years in which it had prevailed in Philadelphia.

I shall briefly describe it in each of the systems, and then take notice of some peculiarities which attended it. Afterwards I shall mention the remedies which were effectual in curing it.

1. The pulse was moderately *tense* in most cases. It intermitted in one case, and in several others the tension was of a transient nature.

Hæmorrhages occurred in many cases. They were chiefly from the nose, but in some instances they occurred from the stomach, bowels, and hæmorrhoidal vessels.

2. Great flatulency attended in the stomach, but sickness and vomiting were much less frequent than in former

years. I saw but one case in which diarrhœa attended this fever.

3. I did not meet with a single instance of a glandular swelling in any part of the body.

4. There was a general disposition to sweat in this fever from its beginning. Two of my patients died, in whom no moisture could be excited on the skin. But I recovered one with a dry skin, by means of a purge, two bleedings, and blisters.

An efflorescence on the skin occurred in several instances. I saw black matter discharged from a blister in one case, and blood in another.

5. The stools were green and black. Bile was generally discharged in puking.

6. The blood exhibited the following appearances: siziness, lotura carniū, sunken crassamentum, red sediment, and what is called dense or unseparated blood. I saw no instance of its being dissolved.

7. The tongue was whitish and dark-coloured. This diseased appearance continued, in some instances, several days after a recovery took place. I saw no smooth, red, nor black tongue, and but one dry and one *natural* tongue. The latter was followed by death.

I did not see a single case in which the disease came on without an exciting cause; such as light clothing and bed-clothes, sitting at doors after night, a long walk, gunning, and violent and unusual exercises of any kind. It was excited in a number of people by their exertions to extinguish a fire which took place in Water-street, between Market and Chesnut-streets, on the morning of the 25th of August. I saw a fatal instance of it succeed a severe tooth-ach. Whether this pain was the exciting cause, or the first morbid symptom of the fever, I know not; but I was led by it to bleed a young lady twice who complained of that pain, and who had at the same time a tense pulse. Her blood had the usual appearances which occur in the yellow fever.

The disease had different appearances in different parts of the city. It was most malignant in Water-street; but in many instances it became less so, as it travelled westward, so that about Ninth-street it appeared in the form of a common intermittent.

In every part of the city it often came on, as in the year 1802, in all the milder forms of autumnal fever formerly enumerated, and went off with all the usual symptoms of yellow fever. Again, it came on with all the force and malignity of a yellow fever, and terminated, in a day or two, in a common remittent or intermittent. These modes of attack were so common, that it was impossible to tell what the character, or probable issue of a fever would be, for two or three days.

The following remedies were found, very generally, to be effectual in this fever.

1. Moderate bleeding. I bled but three patients three, and only one four times. In general, the loss of from ten to twenty ounces of blood, reduced the pulse from a synocha to a synoichoid or typhoid state, and thereby prepared the system for other remedies.

2. Purges were always useful. I gave calomel and jalap, castor oil, salts, and senna, according to the grade of the disease, and often according to the humour or taste of the patient. I aided these purges by glysters. In one case, where a griping and black stools attended, I directed injections of lime-water and milk to be used with the happiest effects.

3. I gave emetics in many cases with advantage, but never while the pulse was full or tense.

4. Having observed, as in the year 1802, a spontaneous moisture on the skin on the first day of the disease, in several cases, I was led to assist this disposition in nature to be relieved by the pores, by means of sweating remedies, but in no instance did I follow it, without previous evacuations from the blood-vessels or bowels; for, however useful the intimations of nature may be in acute diseases, her efforts should never be trusted to alone, inasmuch as they are in most cases too feeble to do service, or so violent as to do mischief. I saw one death, and I heard of another, from an exclusive reliance upon spontaneous sweats in the beginning of this fever. The remedies I employed to promote this evacuation by the pores were, an infusion of the eupatorium perfoliatum in boiling water, aided by copious warm drinks, and hot bricks and blankets, applied to the external surface of the body. The eupatorium sometimes sickened the stomach, and puked.

The sweats were intermitted, and renewed two or three times in the course of four and twenty hours.

5. I derived great advantage from the application of blisters to the wrists, *before* the system descended to what I have elsewhere called the blistering point. This was on the second and third days. My design, in applying them thus early, was to attract morbid excitement to the extremities, and thereby to create a substitute for salivation. They had this effect. The pain, increase of fever, and occasional strangury, which were produced by them, served like anchors to prevent the system being drifted and lost, by the concentration of morbid excitement in the stomach and brain, on the fourth, fifth, sixth, and seventh days of the disease. It gave me great pleasure to find, upon revising Dr. Home's account of the yellow fever, that this mode of applying blisters, in the early stage of the disease, was not a new one. He often applied them in the first stage of the fever, more especially when the yellow colour of the skin made its appearance on the first or second day. By the advice of Dr. Cheney of Jamaica, he was led to prefer them to the thighs, instead of the trunk of the body, or the legs and arms. He forbids their ever being applied below the calf of the legs. This caution is probably more necessary in the West-Indies than in the United States. The pain and inflammation excited by the blisters were mitigated by soft poultices of bread and milk. The strangury soon yielded to demulcent drinks, particularly to flaxseed tea.

I was happy in not being compelled, by the violence or obstinacy of this fever, to resort to a salivation in order to cure it, in a single instance; the discharges from the stomach and bowels, and from the veins, pores, and skin, have proved sufficient to convey the disease out of the system.

Two persons recovered this year who had the black vomiting. One of them was by means of large quantities of brandy and volatile alkali, administered by Dr. John Dorsey, in the city hospital; the other was by means of lime and water and milk, given by an intelligent nurse to one of my patients, during the interval of my visits to her.

From the history which has been given of the symp-

toms of this fever; from the less force of medicine that was necessary to subdue it; from the safety and advantage of blisters in its *early* stage; and from the small proportion which the deaths bore to the number of those who were affected, being seldom more than five in a hundred (including all the grades and forms of the disease,) in the practice of most of the physicians, it is evident this fever was of a less malignant nature than it had been in most of the years in which it had been epidemic. There was one more circumstance which proved its diminution of violence, and that was, a more feeble operation of its remote cause. In the year 1802, nearly all the persons who were affected with the fever in the neighbourhood of Vine and Water-streets, and in Water, between Walnut and Spruce-streets, died. This year, but two died of a great number who were sick in the former, and not one out of twelve who were sick in the latter place. The filth, in both parts of the city, was the same in both years. This difference in the violence and mortality of the fever was probably occasioned by a less concentrated state of the miasmata which produced it, or by the co-operation of a less inflammatory constitution of the atmosphere.

The yellow fever was epidemic, during the summer and autumn of this year, in New-York, and in Alexandria, in Virginia. In the latter place, Dr. Dick had informed the public, it was derived from domestic putrefaction.

AN
ACCOUNT OF SPORADIC CASES
OF
YELLOW FEVER,
AS THEY
APPEARED IN PHILADELPHIA,
IN 1804.

AN ACCOUNT, &c.

THE month of January was marked by deep snows, rain, clear and cold weather, and by the general healthiness of the city.

In February there fell a deep snow, which was followed by several very cold days. There was likewise a fall of snow in March, which was succeeded by an uncommon degree of cold. Catarrhs and bilious pleurisies were very common during both these months.

In the beginning of April, the weather was cold and rainy. There were but few signs of vegetation before the 15th of the month. Bilious pleurisies were still the principal diseases which prevailed in the city.

The month of May was wet, cool, and healthy.

In June, the winds were easterly, and the weather rainy. The crops of grass were luxuriant. It was remarked, that the milk of cows that fed upon this grass yielded less butter than usual, and that horses that fed upon it, sweated profusely with but little exercise. On the third of the month, I was called upon by Dr. Physick to visit his father, who was ill with a bilious fever. He died on the seventh, with a red eye, hiccup, and black vomiting.

Four persons had the yellow fever in the month of July. One of them was in Fourth-street, between Pine and Lombard-streets, another was in Fifth-street, between Race and Vine-streets, both of whom recovered. The remaining two were in the Pennsylvania hospital, both of whom died. Remitting and intermitting fevers were likewise common in this month.

In August, those fevers assumed a chronic form. During this month, there died an unusual number of children with the cholera morbus.

The city was uncommonly healthy in September. A

storm of wind and rain, from the south-east, proved destructive to the crops of cotton this month, on the sea coast of South-Carolina.

In October, intermittents were very common between Eighth-street and Schuylkill. One case of yellow fever came under my care, in conjunction with Dr. Gallaher, on the western banks of that river.

While Philadelphia and all the cities of the United States (Charleston excepted) were thus exempted from the yellow fever as an epidemic, the western parts of all the middle, and several of the southern states, were visited with the bilious fever, in all its different forms. In Delaware county, in the state of New-York, at Mill river, in Connecticut, and in several of the middle counties of Pennsylvania, it prevailed in the form of a yellow fever. In other parts of the United States, it appeared chiefly as a highly inflammatory remittent. It was so general, that not only whole families, but whole neighbourhoods were confined by it. Many suffered from the want of medical advice and nursing, and some from the want of even a single attendant. In consequence of the general prevalence of this fever in some parts of Pennsylvania, the usual labours of the season were suspended. Apples fell and perished upon the ground; no winter grain was sowed; and even cows passed whole days and nights without being milked.

The mortality of this fever was considerable, where those distressing circumstances took place. In more favourable circumstances, it yielded to early depletion, and afterwards to the bark. Relapses were frequent from premature exposure to the air. Those only escaped them who had been salivated, by accident or design, for the cure of the fever.

This disease was observed very generally to prevail most in high situations, which had for years been distinguished for their healthiness, while the low grounds, and the banks of creeks and rivers, were but little affected by it. The unusual quantity of rain, which had fallen during the summer months, had produced moisture in the former places, which favoured putrefaction and exhalation, while both were prevented, in the latter places, by the grounds being completely covered with water.

AN ACCOUNT
OF THE
BILIOUS YELLOW FEVER,
AS IT
APPEARED IN PHILADELPHIA,
IN THE YEAR 1805.

AN ACCOUNT, &c.

FOR a history of the uncommonly cold and tempestuous winter of 1804 and 1805, the reader is referred to the Account of the Climate of Pennsylvania, in the first volume of these Inquiries and Observations.

During the months of January, February, and March, there were a number of bilious catarrhs and pleurisies.

On the 7th of April, I visited a patient in the yellow fever with Dr. Steuart. He was cured, chiefly by copious bleeding.

The weather was rainy in May. After the middle of June, and during the whole month of July, there fell no rain. The mercury in Fahrenheit fluctuated, for ten days, between 90° and 94°, during this month. The diseases which occurred in it were cholera infantum, dysenteries, a few common bilious, and eight cases of yellow fever. Three of the last were in Twelfth, between Locust and Walnut-streets, and were first visited, on the 14th and 15th of the month, by Dr. Hartshorn, as out-patients of the Pennsylvania hospital. Two of them were attended, about a week afterwards, by Dr. Church, in Southwark, and the remaining three by Dr. Rouisseau and Dr. Steuart, in the south end of the city.

On the 3d of August there fell a heavy shower of rain, but the weather, during the remaining part of the month, was warm and dry. The pastures were burnt up, and there was a great deficiency of summer vegetables in the neighbourhood of Philadelphia. The water in the Schuylkill was lower by three inches than it had been in the memory of a man of seventy years of age, who had lived constantly within sight of it.

In September, a number of cases of yellow fever ap-

peared in Southwark,* near Catharine-street. They were readily traced to a large bed of oysters, which had putrefied on Catharine-street wharf, and which had emitted a most offensive exhalation throughout the whole neighbourhood, for several weeks before the fever made its appearance. This exhalation proved fatal to a number of cats and dogs, and it now became obvious that the two cases of yellow fever, that were attended by Dr. Church, in the month of July, were derived from it. An attempt was made to impose a belief that they were taken by contagion from a ship at the lazaretto, which had lately arrived from the West-Indies; but a careful investigation of this tale proved, that neither of the two subjects of the fever had been on board that, nor any other ship, then under quarantine.

The fever prevailed during the whole of this month in Southwark. A few cases of it appeared in the city, most of which were in persons who had resided in, or visited that district. It was brought on by weak exciting causes in Southwark, but the cases which originated in the city, required strong exciting causes to produce them.

A heavy rain, accompanied with a good deal of wind, on the 28th of September, and a frost on the night of the 7th of October, gave a considerable check to the fever.

But few cases of it came under my care. Having perceived the same disposition in nature to relieve herself by the pores, that I observed in the years 1802 and 1803, my remedies were the same as in the latter year, and attended with the same success. Dr. Caldwell and Dr. Steuart, whose practice was extensive in Southwark, informed me those remedies had been generally successful in their hands.

The only new medicine that the experience of this year suggested in this disease, was for one of its most distressing and dangerous symptoms, that is, the vomiting which occurs in its second stage. Dr. Physick discovered, that ten drops of the spirit of turpentine, given every two hours, in a little molasses, or syrup, or sweet oil, effectually checked it in several instances, in patients who afterwards recovered. It was administered with equal success

* This extensive district is continued, from the city of Philadelphia, along the Delaware, but is not subject to its government.

in a case which came under my care, after an absence of pulse, and a coldness of the extremities had taken place. Dr. Church informed me that he gave great relief to the sick in the city hospital, by this medicine, by prescribing it in glysters, as well as by the mouth, in distressing affections of the stomach and bowels.

Dr. Steuart observed that all those persons who had been affected by the yellow fever in former years, had mild remittents in the same situations that others had the prevailing epidemic in a malignant form.

In one of four bodies the Doctor examined, he found six, and in another three intussusceptions of the intestines, without any signs of inflammation. He discovered the common marks of disease from this fever in other parts of those bodies.

The deaths from this fever amounted to between three and four hundred. They would probably have been more numerous, had not those families who were in competent circumstances fled into the country, and had not the poor been removed, by the board of health, from the infected atmosphere of Southwark, to tents provided for them in the neighbourhood of the city; and they would probably have been fewer, considering the tractable nature of the disease, when met by suitable remedies in its early stage, had not the sick concealed their indisposition, in many instances, for two or three days, lest they should be dragged to the city hospital, or have centinels placed at their doors to prevent any communication with their friends and neighbours. While these attempts were made to check the progress of the fever, it did not escape the notice of many of the citizens of Philadelphia, that not a single instance occurred of its being communicated by contagion, in any of the families in the city, in which persons had sickened or died with it, and that while the sick were deprived of the kind offices of their friends and neighbours, lest they should be infected, physicians, and the members of the board of health, passed by the guards every day, in their visits to the same sick people, and afterwards mixed with their fellow-citizens, in every part of the city, without changing their clothes.

The yellow fever appeared early in the season in New-Heaven, in Connecticut, and in Providence, on Rhode-

Island, in both of which places it was derived from putrid exhalation, and was speedily and effectually checked by removing the healthy persons who lived in its neighbourhood to a distance from it. Several sporadic cases of it occurred during the autumn in Gloucester county, in New-Jersey, and in Mifflin and Chester counties, in Pennsylvania. It was epidemic in New-York at the same time it prevailed in Southwark and Philadelphia. The following extract of a letter from the health officer of New-York, to one of his friend, contains a satisfactory proof that it was not, in that city, an imported disease.

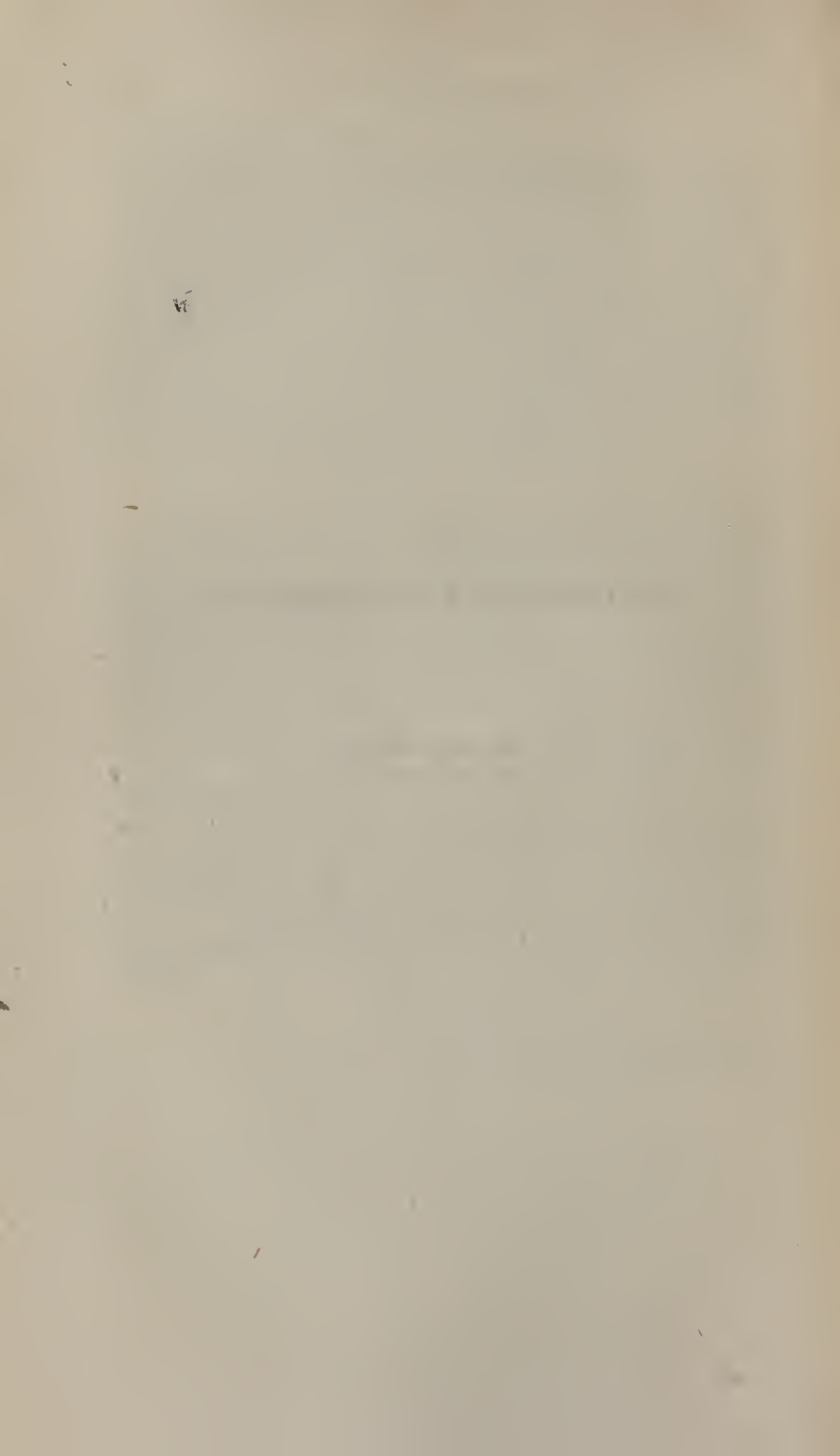
Quarantine-ground, Sep. 7, 1805.

I most sincerely and tenderly deplore the unfortunate situation of our city. What do people say now of the origin of the disease? You may state for the information of those who wished to be informed, that not a single vessel, on board of which a person has been sick with fever of any kind, or on board of which any person has died with any disease, while in the West-Indies, or on the voyage home, has ever gone up to the city during the whole season. This we know, and this we vouch for; and farther state, that all the cases of fever that have come down as from the city, have been all people of, and belonging to the city, and unconnected with the shipping, excepting one, a sailor, who had no connection with any foul vessel. There is not a shadow of proof or suspicion that can attach to the health-office, or to infected vessels, this season.

I am, &c.

JOHN R. B. RODGERS.

AN
ACCOUNT OF THE DISEASES
OF
1806, 1807, 1808, AND 1809.



AN ACCOUNT, &c.

ON the 21st of January in the year 1806, Lieutenant M'Keller died of a yellow fever accompanied with a black vomiting. A son of Mr. William Flintham in Keys's-alley, died of the same disease, and with the same black discharge from his stomach on the 5th of May. On the 16th of June, there was a partial eclipse of the sun. The mercury descended in the thermometer during its continuance, between 9° , and 10° in Philadelphia. At Haverhill, in Massachusetts, it fell from 92° to 62° , in the thermometer. In Boston the mercury suddenly mounted to a great height in the barometer. During the time of this partial darkness, fowls and cattle near the city, retired to rest, and all the maniacs in the Pennsylvania hospital suddenly became silent, but I saw no change induced in the symptoms of the diseases of any of the patients who were then under my care, by means of this eclipse. In the month of September the yellow fever prevailed in the penitential house at Richmond in Virginia, where its origin was previously traced to domestic putrefaction.

In the month of March 1807, the influenza appeared at the same time in nearly all the states in the Union. It prevailed in sporadic cases during the months of April, May, June, and July, in Philadelphia, but in August it became general. It affected children as well as adults, and persons ill with other diseases, as well as the healthy. Asthma, consumption, madness, parturition, and even a salivation afforded no protection from it. Seven old persons between 80 and 100, and one of 107 died with it. The bilious fever which prevailed in August imparted to it several of its symptoms. These were obvious remissions and intermissions, great pain in the back, an apparent cessation of the symptoms of the disease on the third, and a return of them on the fourth day, cholera morbus,

dysentery and an efflorescence upon the skin. The disease appeared in one respect to be a monster. Its head and breast wore the characters of influenza, while its trunk and limbs indicated it to be a bilious fever.

It increased gradually until the 20th of August. After which time it gradually declined. This was evident not only from general observations, but from a list which was put into my hands of the number of persons that were bled each day of the month, by one of the most popular bleeders in the city.

Dr. Dorsey informed me that he had attended two persons in the yellow fever in the course of this month.

In February 1808, the measles made their appearance, and prevailed during the months of March and April. They were at first of a mild character, but afterwards they became highly inflammatory, so as to require frequent and copious bleedings.

In the month of August, bowel complaints were unusually common among adults. They were ascribed in part to the use of bread made of flour, which had become musty from having remained an unusual time in the mills and stores, in consequence of the operation of the embargo law. On the 17th of August I attended and cured an apprentice of Mr. William M'Corkle, who had all the common symptoms of a malignant yellow fever.

The month of September was unusually dry and healthy. The healthiness of a great number of the citizens of Philadelphia during this season, was ascribed to their general and constant employment in the open air, in all those arts and labours which are connected with the building of two churches, two shot manufactories and 600 houses.

The spring of the year 1809 was unusually cold, so as to render vegetation every where in the neighbourhood of Philadelphia eighteen days later than in ordinary years. There were a number of cases of sporadic influenza in the month of May. On the first and second days of June, fires were comfortable. The weather in the two succeeding summer months was uncommonly cool. On the 22d day of July, Mr. Richard Durdon, the step son of William Lewis, Esq. died of the yellow fever accompanied with black and bloody discharges upwards and downwards, on the fourth day of his disease. Its seeds were derived from

some putrid fish in a store in Water-street between Walnut and Chesnut-streets. Several other persons were affected with the yellow fever, or lightly indisposed, from the same cause. By removing the putrid fish and cleansing the store, the disease ceased in the course of a few weeks. From the result of observations upon the degrees of heat in Philadelphia, in June and July, between the year 1793 and 1809, collected and published by Mr. Cadwallader Evans in the "True American," of the 2d of August 1809, it appears, that the yellow fever has never been epidemic in our city when the medium heat of those two summer months was below 79° , except in 1802 when it was 78° , and in which year not more than 200 persons were supposed to have died of it. The medium heat of June and July of the present year, was but 74° . Time alone can determine, whether this moderate temperature of the air will produce the same general exemption from the disease, that it has produced in former years.* There was one circumstance which favoured the expectation excited by Mr. Evans's observations, of the city escaping an epidemic yellow fever, and that was, a chronic, or protracted remitting fever, of a moderate grade, prevailed during the months of July and August in every part of the city and suburbs; from which it was natural to infer, the constitution of the atmosphere did not dispose to malignant fevers.

Upon the subject of the meteorological observations published by Mr. Evans, I shall only add, however generally the yellow fever may require a greater degree of medium summer heat to produce it than 79° in Philadelphia, it is certain fevers from exhalations have often prevailed in other countries in a much lower temperature. Dr. Huxham and several other physicians describe bilious fevers in open winters, and particularly after a sudden thaw has succeeded a great frost.†

From a number of observations made through a course of many years by an intelligent citizen of Philadelphia, I am led to believe that an exemption from the yellow fever in our city is intimately connected with the state of the winds in March and April. The more they blow from the north-west, the drier they are, and the more completely

* This sentence was written about the middle of August 1809.

† On air and epidemic diseases, vol. i. p. 19.

they carry off the putrid matters which have been thrown upon the surface of the earth by the warmth of the vernal sun. Those winds have been called "hungry," from their being supposed to devour the matters which they convey from our sight. A dry wind in the spring, in a certain part of Ireland, has been observed to produce the same effect upon the healthiness of the succeeding months.

Having concluded the history of the bilious yellow fever as it has appeared in Philadelphia every year, 1808 only excepted, since 1793, as an epidemic or in sporadic cases, I shall proceed next to enumerate all the sources of that fever, as well as all the other usual forms of the summer and autumnal disease of the United States, and afterwards mention the means of preventing them.

AN INQUIRY
INTO
THE VARIOUS SOURCES
OF THE USUAL FORMS OF
SUMMER AND AUTUMNAL DISEASE,
IN THE UNITED STATES,
AND THE
MEANS OF PREVENTING THEM.

AN INQUIRY, &c.

THE business of the following inquiry is,

I. to enumerate the various sources of the usual forms of the summer and autumnal disease of the United States. And,

II. To mention the means of preventing them.

To render the application of those means as extensive as possible, it will be proper to mention, under the first head, all those sources of summer and autumnal disease, which have been known to produce it in other countries, as well as in the United States. They are,

1. Exhalations from Marshes. These are supposed to be partly of a vegetable, and partly of an animal nature. They are derived from the shores of creeks and mill ponds, as well as from low and wet grounds; also from the following vegetable substances in a state of putrefaction.

2. Cabbage. A malignant fever was produced at Oxford, by a putrid heap of this vegetable some years ago, which proved fatal to many of the inhabitants, and to several of the students of the university at that place.

3. Potatoes. Nearly a whole ship's crew perished at Tortola, by removing from her hold, a quantity of putrid potatoes.

4. Pepper.

5. Indian meal.

6. Onions.

7. Mint.

8. Anise and caraway seeds, confined in the hold of a ship.

9. Coffee. "About the time," says Dr. Trotter, "when notice was taken of the putrefying coffee on the wharf at Philadelphia, in the year 1793, a captain of a man of war, just returned from the Jamaica station, informed me, that

several vessels laden with the same produce came to Kingston, from St. Domingo. During the distracted state of that colony, this article, with other productions, had been allowed to spoil and ferment. The evolution of a great quantity of fixed air, or carbonic acid gas, was the consequence; and in these vessels, when opening the hatchways, such was its concentrated state, that the whole of the crew, in some of them, were found dead on the deck. A pilot boarded one of them in this condition, and had nearly perished himself."*

10. Chocolate shells.

11. Cotton which had been wetted on board of a vessel that arrived in New-York, a few years ago, from Savannah, in Georgia.

12. Hemp, flax, and straw.

13. The canvas of an old tent.

14. Old books, and old paper money, that had been wetted, and confined in close rooms and closets.

15. The timber of an old house. A fever produced by this cause is mentioned by Dr. Haller, in his *Bibliotheca Medicinæ*.

16. Green wood confined in a close cellar during the summer months. A fever from this cause was once produced in this city, in a family that was attended by the late Dr. Cadwallader.

17. The green timber of a new ship. Captain Thomas Bell informed me, that in a voyage to the East-Indies, in the year 1784, he lost six of his men with the scurvy, which he supposed to be derived wholly from the foul air emitted by the green timber of the ship. The hammocks which were near the sides of the ship rotted during the voyage, while those which were suspended in the middle of the ship, retained their sound and natural state. This scurvy has been lately proved by Dr. Claiborne, in an ingenious inaugural dissertation, published in Philadelphia, in the year 1798, to be a misplaced state of malignant fever. Dr. Lind mentions likewise the timber of new ships as one of the sources of febrile diseases. The timber of soldiers' huts, and of the cabins of men who follow the business of making charcoal in the woods, often pro-

* *Medicina Nautica*. p. 324.

duce fevers, as soon as the bark begins to rot and fall from them, which is generally on the second year after they are erected. Fevers have been excited even by the exhalation from trees, that have been killed by being girdled in an old field.

18. The stagnating air of the hold of a ship.

19. Bilge water.

20. Water that had long been confined in hogsheds at sea.

21. Stagnating rain water.

22. The stagnating air of close cellars.

23. The matters which usually stagnate in the gutters, common sewers, docks, and alleys of cities, and in the sinks of kitchens. A citizen of Philadelphia, who had a sink in his kitchen, lost a number of cats and dogs by convulsions. At length one of his servants was affected with the same disease. This led him to investigate the cause of it. He soon traced it to his sink. By altering its construction, so as to prevent the escape of noxious air from it, he destroyed its unwholesome quality, so that all his domestics lived in good health in his kitchen afterwards.

24. Air emitted by agitating foul and stagnating water. Dr. Franklin was once infected with an intermitting fever from this cause.

25. A duck pond. The children of a family in this city were observed, for several successive years, to be affected with a bilious remitting fever. The physician of the family, Dr. Phineas Bond, observing no other persons to be affected with the same fever in the neighbourhood, suspected that it arose from some local cause. He examined the yard belonging to the house, where he found an offensive duck pond. The pond was filled with earth, and the family were afterwards free from an annual bilious fever.

26. A hog-stye has been known to produce violent bilious fevers throughout a whole neighbourhood in Philadelphia.

27. Weeds cut down and exposed to heat and moisture near a house.

Fevers are less frequently produced by putrid animal, than by putrid vegetable matters. There are, however,

instances of their having been generated by the following animal substances in a state of putrefaction.

1. Human bodies that have been left unburied upon a field of battle.

2. Salted beef and pork.

3. Locusts.

4. Raw hides confined in stores, and in the holds of ships.

5. A whale thrown upon the sea shore in Holland.

6. A large bed of oysters. The malignant fevers which prevailed in Alexandria, in Virginia, in 1803, and in Southwark, adjoining Philadelphia, in the year 1805, were derived from this cause.*

7. The entrails of fish. And,

8. Privies. The diarrhœa and dysentery are produced, oftener than any other form of summer and autumnal disease, by the fœtor of privies. During the revolutionary war, an American regiment, consisting of 600 men, were affected with a dysentery, from being encamped near a large mass of human fæces. The disease was suddenly checked by removing their encampment to a distance from it. Five persons in one family were affected with the yellow fever in Philadelphia, in 1805, who lived in a house in which a privy in the cellar emitted a most offensive smell. No one of them had been exposed to the foul air of Southwark, in which the fever chiefly prevailed in the autumn of that year. Three of them sickened at the same time, which obviated the suspicion of the disease being produced by contagion.

The miasmata which are exhaled from putrid vegetable and animal matters, are much varied by circumstances, in their effects upon the body. Certain vegetables, particularly coffee, potatoes, and hemp, in a state of putrefaction, exhale a more noxious gas than any other vegetables, and putrid *salted* meat and fish, are more disposed to produce malignant fevers than meat and fish that are fresh, and both are more destructive when they exhale their miasmata from

* It has been a common practice with many families, in New-York and Philadelphia, for several years past, to lay in a winter store of oysters in their cellars in the fall of the year. May not a part of these oysters, left in these cellars from forgetfulness, or from being unfit for use, become, by putrefying there, the cause of malignant fevers in the succeeding summer and autumn?

places which have been confined, than in the open air. This is one reason why the yellow fever generally makes its first appearance and is attended with most mortality near the wharves and water streets of sea port towns, the miasmata in such places being emitted from putrid animal and vegetable matters, which had been confined in stores, cellars and the holds of ships.

There are several other sources of malignant fevers besides those which have been mentioned. They are, exhalations from volcanoes, wells, and springs of water; also flesh,* fish, and vegetables, eaten in a putrid state; but these seldom act in any country, and two of them only, and that rarely, in the United States.

It has been said that we sometimes meet with bilious fevers in situations where no exhalations had taken place from any of the sources that have been enumerated. Dr. Gordon informed me that 500 persons died of the yellow fever in Berbice between July 1804 and May 1805, during which time there fell not quite three inches of rain. The earth in this case was every where dry and parched. Bilious fevers, Sir John Pringle tells us, occur in a part of Holland in very dry seasons, but in these cases the earth stagnates below its surface. The same cause which produced these fevers in Holland, probably induced the fever at Berbice, mentioned by Dr. Gordon, as also all such bilious fevers as appear under the same circumstances of the apparent absence of moisture and putrefaction.

The usual forms of the disease produced by miasmata from the sources of them which have been enumerated are,

1. Malignant or yellow bilious fever.
2. Inflammatory bilious fever.
3. Mild remittent.
4. Mild intermittent.

* The following fact, communicated to me by Mr. Samuel Lyman, a member of congress from the state of Massachusetts, shows the importance of attending to the condition of butcher's meat in our attempts to prevent malignant fevers.

A farmer in New-Hampshire, who had overheated a fat ox by excessive labour in the time of harvest, perceiving him to be indisposed, instantly killed him, and sent his flesh to a neighbouring market. Of twenty-four persons who ate of this flesh, fifteen died in a few days. The fatal disease produced by this aliment fell, with its chief force, upon the stomach and bowels.

5. Chronic, or what is called nervous fever, or the autumnal fever in a protracted form.

6. Febricula.

7. Dysentery.

8. Cholic.

9. Cholera morbus.

10. Diarrhœa.

In deriving all the above forms of disease from miasmata, I do not mean to insinuate, that sporadic cases of each of them are not produced by other causes.

In designating them by a single name, I commit no breach upon the ancient nomenclature of medicine. The gout affects not only the blood-vessels and bowels, but every other part of the body, and yet no writer has, upon that account, distinguished it by a plural epithet.

The four last forms of disease, that have been mentioned, have been very properly called intestinal states of fever. They nearly accord, in their greater or less degrees of violence and danger, with the first four states of fever which occupy the blood-vessels, and in the order in which both of them have been named. I shall illustrate this remark by barely mentioning the resemblance of the yellow fever to the dysentery, in being attended with costiveness in its first stage, from a suspended or defective secretion or excretion of bile, and in terminating very generally in death, when not met by the early use of depleting remedies.

The variety in the forms and grades of the summer and autumnal disease, in different seasons, and their occasional changes into each other in the same seasons, are to be sought for in the variety of the sensible and insensible qualities of the atmosphere, of the course of the winds, and of the aliments of different years.

II. The means of preventing the different forms of disease that have been mentioned, come next under our consideration.

Happily for mankind, Heaven has kindly sent certain premonitory signs of the most fatal of them. These signs appear,

I. External, in certain changes in previous diseases, in the atmosphere, and in the animal and vegetable creation.

II. In the human body.

1. The first external premonitory sign that I shall mention is, an unusual degree of violence in the diseases of the previous year or season. Many proofs of the truth of this remark are to be met with in the works of Dr. Sydenham. It has been confirmed in Philadelphia, in nearly all her malignant fevers since the year 1793. It would seem as if great and mortal epidemics, like the planets, had satellites revolving round them, for they are not only preceded, but accompanied and followed, by diseases which appear to reflect back upon them some of their malignity. But there is an exception to this remark, for we now and then observe uncommon and general healthiness, before the appearance of a malignant epidemic. This was the case in Philadelphia, previously to the fevers of 1798 and 1799. I have ascribed this to the stimulus of the pestilential miasmata barely overcoming the action of weak diseases, without being powerful enough to excite a malignant fever.

2. Substances, painted with white lead, and exposed to the air, suddenly assuming a dark colour; and winds from unusual quarters, and unusual and long protracted calms, indicate the approach of a pestilential disease. The south winds have blown upon the city of Philadelphia, ever since 1793, more constantly than in former years. A smokiness or mist in the air, the late Dr. Matthew Wilson has remarked, generally precedes a sickly autumn in the state of Delaware.

3. Malignant and mortal epidemics are often preceded by uncommon sickness and mortality among certain birds and beasts. They have both appeared, chiefly among wild pigeons and cats, in the United States. The mortality among cats, previous to the appearance of epidemics, has been taken notice of in other countries. Dr. Willan says it occurred in the city of London, between the 20th of March and the 20th of April, in the year 1797, before a sickly season, and Dr. Bunciva says it preceded a mortal epidemic in Paris. The cats, the Doctor remarks, lose on the second day of their disease, the power of emitting electrical sparks from their backs, and, when thrown from a height, do not, as in health, fall upon their feet.*

* Medical Journal, vol. iv.

4. The common house fly has nearly disappeared from our cities, moschetoës have been multiplied, and several new insects have appeared, just before the prevalence of our late malignant epidemics.

5. Certain trees have emitted an unusual smell; the leaves of others have fallen prematurely; summer fruits have been less in size, and of an inferior quality; and apples and pears have been knotty, in the summers previous to several of our malignant autumnal fevers. Dr. Ambrose Parey says, an unusually rapid growth of mushrooms once preceded the plague in Paris.

II. The premonitory signs of an approaching malignant epidemic in the human body are,

1. A sudden drying up, or breaking out of an old sore; fresh eruptions in different parts of the body; a cessation of a chronic disease, or a conversion of a periodical into a continual disease. Of this there were many instances in Philadelphia, in the year 1793.

2. A peculiar sallowness of the complexion. This was observed to be general in Philadelphia, previous to the yellow fever of 1793. Dr. Dick informed me, that he had observed the same appearance in the faces of the people of Alexandria, accompanied in some cases with a yellowness of the eyes, during the summer of 1793, and previous to the appearance of a violent bilious fever on the banks of the Potowmac.

3. I have observed one or more of the following symptoms, namely, head-ach; a decay, or increase of appetite; costiveness; a diminished or increased secretion of urine; a hot and offensive breath;* constant sweats, and sometimes of a fœtid nature, or a dry skin; wakefulness, or a

* I have once known this breath, in a gentleman who had carried the seeds of the yellow fever in his body from Philadelphia into its neighbourhood, create sickness at the stomach in his wife; and I have heard of an instance in which a person, who left Philadelphia when highly impregnated with the miasmata of the same fever, creating sickness at the stomach in four or five persons who sat at the same table with him in the country. None of the above persons were afterwards affected by the fever. In an anonymous history of the plague in London, in the year 1664, in the possession of the author, it is said, the breath was a well-known signal of infection to persons who were not infected, and that whenever it was perceived, individuals and companies fled from it. The sickness in the above-mentioned persons was similar to that which is sometimes excited by the smell of a sore leg, or a gun-shot wound, upon the removal of its first dressing. It does not produce fever, because there is no predisposition to it.

disposition to early or protracted sleep; a preternaturally frequent pulse; unusual vivacity, or depression of spirits; fatigue and sweats from light exertions; hands, when rubbed, emitting a smell like *hepar sulphuris*; and, lastly, a sense of burning in the mouth; to be present in different persons, during the prevalence of our malignant epidemics.

The means of preventing the different forms of our summer and autumnal disease comes next under our consideration. I shall first mention such as have been most effectual in guarding against its malignant form, and afterwards take notice of such as are proper in its milder grades. These means naturally divide themselves again,

I. Into such as are proper to protect individuals.

II. Such as are proper to defend whole communities from the disease. And,

III. Such as are proper to exterminate it, by removing its causes.

I. Of the means of protecting individuals.

Where flight is practicable, it should be resorted to in every case, to avoid an attack of a malignant fever. The heights of Germantown and Darby have, for many years, afforded a secure retreat to a large number of the citizens of Philadelphia, from their late annual epidemics. It were to be wished our governments possessed a power of compelling our citizens to desert the whole, or parts, of infected cities and villages. In this way the yellow fever was suddenly annihilated in Providence, on Rhode-Island, and in New-Haven, in Connecticut, in the year 1805. But the same power should rigorously prevent the removal of the sick, except it be that class of them which have neither homes nor friends. The less the distance they are carried beyond the infected atmosphere, the better. The injury sustained by conveying them in a jolting carriage, for two or three miles, has often been proclaimed in the reports of our city hospitals, of patients being admitted without a pulse, and dying a few hours afterwards.

In leaving a place infected by miasmata, care should be taken not to expose the body to great cold, heat, or fatigue, for eighteen or twenty days, lest they should excite the dormant seeds of the disease into action.

But where a flight is not enforced by law, or where it is not practicable, or preferred, safety should be sought for

in such means as reduce the preternatural tone and fulness induced in the blood-vessels by the stimulus of the miasmata, and the suppression of customary secretions.—These are,

1. A diet, accommodated to the greater or less exposure of the body to the action of miasmata, and to the greater or less degrees of labour, or exercise, which are taken. In cases of great exposure to an infected atmosphere, with but little exercise, the diet should be simple in its quality, and small in its quantity. Fresh meats and wine should be avoided. A little salted meat, and Cayenne pepper with vegetables, prevent an undue languor of the stomach, from the want of its usual cordial aliments. The less mortality of the yellow fever in the French and Spanish West-India islands than in the British, has been justly attributed to the more temperate habits of the natives of France and Spain. The Bramins, who live wholly upon vegetables, escape the malignant fevers of India, while whole regiments of Europeans, who eat animal food, die in their neighbourhood. The people of Minorca, Dr. Cleghorn says, who reside near gardens, and live chiefly upon fruit during the summer, escape the violent autumnal fever of that island. The Jews in Surinam, Dr. Nassy tells us in his history of the settlement, escape bilious fevers, by eating fruit at 12 o'clock, and using fish oil, and a considerable quantity of spices, particularly pepper in their aliment, while the christians who eat and drink agreeably to their European habits, perish in great numbers by those diseases. The field negroes of South-Carolina owe their exemption from bilious fevers to their living chiefly upon vegetables. There is a fact which shows, that not only temperance, but abstinence bordering upon famine, has afforded a protection from malignant fevers. In a letter which I received a few months ago, from the Rev. Thomas Hall, chaplain to the British factory at Leghorn, containing an account of the yellow fever which prevailed in that city, in the summer and autumn of 1804, there is the following communication. “Of the *rich*, who live in airy houses, there died but four persons with the fever. Of the *commodious*, who live comfortably, but not affluently, there died ten. Of the *poor*, who inhabited small and crowded rooms, in the dirty and confined parts of the city, there died nearly seven hundred. But of the *beggars*, who had scarcely any thing

to eat, and who slept half naked every night upon hard pavements, not one died." From the reduced and exhausted state of the system in these people they were incapable, if I may be allowed the expression, of the combustion of fever. Persons reduced by chronic diseases, in like manner, often escape such as are acute. Six French ships of the line landed three hundred sick, at St. Domingo, while the yellow fever prevailed there in the year 1745, and yet no one of them was infected by it.*

Where the body is exposed to miasmata, and a great deal of exercise taken at the same time, broth, a little wine, or malt liquors, may be used with the fruits and garden vegetables of the season, with safety and advantage. The change from a full to a low diet should be made gradually. When made suddenly, it predisposes to an attack of the disease.

2. Laxative medicines. Hundreds, perhaps thousands, of the citizens of Philadelphia were indebted for their preservation from the yellow fever, to the occasional use of a calomel pill, a few grains of rhubarb, or a table spoonful of sweet, or castor oil, during the prevalence of our late pestilential fevers. Even the air of Batavia has been deprived of its poisonous quality, by means of this class of medicines. A citizen of Philadelphia asked a captain of a New-England ship, whom he met at that island, how he preserved the whole crew of his ship in health, while half the sailors of all the other ships in the harbour were sick or dead. He informed him, that it was by giving each of them a gentle purge of sulphur every day.

3. A plentiful perspiration, or moderate sweats, kept up by means of warm clothing and bed clothes. The excretion which takes place by the skin, is a discharge of the first necessity. I have never known an instance of a person's being attacked by the yellow fever in whom this discharge was constant, and equally diffused all over the body. Its effects are equally salutary in preventing the plague. So well known is this fact, that Mr. Volney informs us in his Travels into Egypt, that the common salutation at Cairo, during the prevalence of the plague, is, "Do you sweat freely?" For the purpose of promoting this excretion, flannel shirts or waistcoats worn next to the skin have been

* Desportes, vol. i. p. 140.

found more useful than linen. As the perspiration and sweats, which are thus discharged in a Pestilential season, are often unusual in their quantity, and of a morbid quality, clean body-linen or flannel should be put on every day, and where this is not practicable, that which has been worn should be exchanged every morning and evening for that which has been exposed during the previous day and night, in a dry air.

4. Blood-letting. In addition to the authorities of Dr. Haller and Dr. Hodges, mentioned in another place,* in favour of this remedy, I shall subjoin a few others. Dr. Mitchell, in his Account of the Yellow Fever which prevailed in Virginia, in the year 1741, informs us, that it was often prevented in persons who were under the influence of its remote cause, by the loss of a few ounces of blood. It was formerly a practice among the Physicians in St. Domingo, to bleed whole regiments of troops as soon as they arrived from France, by which means they were preserved from the malignant fever of the island.

During the short visit paid to this city, in the year 1798, by Dr. Boland, a respectable physician of the British army, he put into my hands the following communication. "In the beginning of the August, 1797, 109 Dutch artillery arrived at Port au Prince, in the Baugalore transport. The florid appearance of the men, their cumbersome clothing, and the season of the year, seemed all unfavourable omens of the melancholy fate we presumed awaited them. It was, however, thought a favourable opportunity, by Dr. Jackson and myself, to try what could be done in warding off the fever. It was accordingly suggested to Monsier Conturier, the chief surgeon of the foreign troops, and the surgeon of the regiment, that the whole detachment should be blooded freely, and that, the morning after, a dose of physic should be administered to every man. This was implicitly complied with, a day or two after, and at this moment in which I write, although a period of four months has elapsed, but two of that detachment have died, one of whom was in a dangerous state when he landed. A success unparalleled during the war in St. Domingo! It is true, several have been attacked with the disease, but

* Account of the Yellow Fever in 1793, vol. iii.

in those the symptoms were less violent, and readily subsided by the use of the lancet.

"The *crew* of the *Bangalore*, on her arrival at Port au Prince, consisted of twenty-eight men. With them no preventive plan was followed. In a very few weeks, eight died, and at present, of the original number, but fourteen remain."

All these depleting remedies, whether used separately or together, induce such an artificial debility in the system, as disposes it to vibrate more readily under the impression of the miasmata. Thus the willow rises, after bowing before a blast of wind, while the unyielding oak falls to the ground by its side. It is from the similarity of the natural weakness in the systems of women, in the West-Indies, with that which has been induced by the artificial means that have been mentioned, that they so generally escape the malignant endemic of the islands.

A second class of preventives of malignant fever are such as obviate the internal action of miasmata, by exciting a general or partial determination to the external surface of the body. These are,

1. The warm bath. I have known this grateful remedy used with success in our city. It serves the treble purposes of keeping the skin clean, and the pores open, and of defending what are called the vital organs from disease, by inviting its remote cause to the external surface of the body.

2. The cold bath, or cold water applied to the external surface of the body. Ulloa, in his travels through Cuba, tells us the Spaniards make it a practice, when partially wetted by rain, to plunge themselves, with their wet clothes on, into the first stream of water they meet with afterwards, by which means they avoid taking the fever of the island. When this cannot be conveniently done, the peasants strip off their clothes, and put them under a shelter, and receive showers of rain upon their naked bodies, and thus preserve themselves from the fever. Dr. Baynard has left it upon record, in his treatise upon the cold bath, that those persons who lived in water-mills, also watermen, bargemen, and fishermen, who were employed upon the river, and in dabbling in cold water, were rarely affected by the plague in London in

1665, and that but two persons died with it on London bridge. The water carriers at Cairo, Mr. Volney says, uniformly escape the plague; and, Dr. Chisholm informs us, that those negroes in Demarara who go naked, and are thereby disposed not to avoid showers of rain, are never affected with the fever of that country.

3. Washing the body every morning and evening with salt water. A whole ship's crew from Philadelphia was preserved by this means from the yellow fever, some years ago, in one of the West-India islands, while a large proportion of the crews of several ships, that lay in the same harbour, perished by that disease.

4. Anointing the body with oil. The natives of Africa, and some American Indians, use this preventive with success during their sickly seasons. It has lately been used, it is said, with effect in preventing the plague. Its efficacy for that purpose was first suggested by no oilman having died of that disease during four years, in which time 100,000 people perished with it in Egypt. Oliver, in his travels into that country, says, the men who make and sell butter, are equally fortunate in escaping it.

5. Issues, setons, and blisters, belong to this class of preventives of malignant and bilious fevers.

Issues, according to Parisinus, Florentinus, and several other authors quoted by Diemerbroeck, have prevented the plague in many hundred instances. Parcæus says, ail who had ulcers from the venereal disease, or any other cause, escaped it. Dr. Hodges owed his preservation from the plague in London, in 1665, to an issue in his leg. He says he always felt a slight pain in it when he went into a sick room. Dr. Gallager ascribed his escape from the yellow fever of 1799 to a perpetual blister, which he applied to his arm for that purpose. Dr. Barton favoured me with a sight of a letter from Dr. James Stevens, dated January 12th, 1801, in which he says he believed Dr. Beach (formerly of Connecticut,) had been preserved from the bilious fever by a seton in his side. He adds further, that Dr. Beach had been called to attend the labourers at Onandogo salt springs, in the state of New-York, ninety-eight of whom out of a hundred had the bilious fever. Of the two who escaped it, one had a sore leg, the other what is called a scald head. The discharge from the sores in

each of them, as well as from the doctor's issue, was more copious during the prevalence of the fever, than it had been at any other time.

A third class of preventives of malignant fever, are such as excite a general action, more powerful than that which the miasmata are disposed to create in the system, or an action of a contrary nature. These are,

1. Onions and garlic. All those citizens who used these vegetables in their diet, escaped the yellow fever in 1793. The greater exemption of the natives of France from this disease, wherever they are exposed to it, than of the inhabitants of other European countries, has been ascribed in part to the liberal use of those condiments in their food. The Jews, it has been said, have often owed to them their preservation from the plagues which formerly prevailed in Europe. It is probable leeks and onions, which to this day form a material part of the diet of the inhabitants of Egypt, were cultivated and eaten originally as the means of obviating the plagues of that country. I have been at a loss to know why the Author of Nature, who has endowed these vegetables with so many excellent qualities for diet and medicine, should have accompanied them with such a disagreeable smell. Perhaps the reason was, kindly to force them into universal use; for it is remarkable their smell in the breath is imperceptible to those who use them.

2. Calomel, taken in such small doses as gently to affect the gums. It preserved most of the crew of a Russian ship at Plymouth, in the year 1777, from a fever generated by filth in her hold. In a letter which I received from Captain Thomas Truxton, in the year 1797, he informed me, that an old and respectable merchant at Batavia had assured him, he had been preserved in good health by calomel, taken in the way that has been mentioned, during the sickly seasons, for upwards of thirty years. The mortality of the fevers of that island may easily be conceived of, when I add, on the authority of a physician quoted in Sir George Staunton's Account of his Embassy to China, that one half of all new comers die there on the first year of their arrival.

Our principal dependence should be placed upon those two preventives under this head. There are several others which have been in common use, some of which I believe are hurtful, and the rest are of feeble, or doubtful efficacy. They are,

3. Wine and ardent spirits. They both prevent a malignant fever, only when they excite an action in the system above that which is ordinarily excited by the miasmata of the fever; but this cannot be done without producing intoxication, which, to be effectual, must be perpetual; for the weakness and excitability, which take place in the intervals of drunkenness, predispose to the disease. Agreeably to this remark, I observed three persons, who were constantly drunk, survive two of our most fatal epidemics, while all those persons who were alternately drunk and sober, rarely escaped an attack of the fever. In most of them it terminated in death.

4. Tobacco. Many hundreds of the citizens of Philadelphia can witness, that no benefit was derived from this weed, in any of the ways in which it is commonly used, in the late epidemics of our city. Mr. Howard says it has no effect in preserving from the plague.

5. Camphor suspended in a bag round the neck, and rags wetted in vinegar, and applied to the nose. These means were in general use in the fever of 1793, in Philadelphia, but they afforded no protection from it. It is possible they had a contrary effect, by entangling in their volatile particles, more of the miasmata of the fever, and thus increasing a predisposition to it.

A fourth class of preventives of malignant fevers are certain substances which are said to destroy miasmata by entering into mixture with them. Two persons, who were very much exposed to the causes of the fever in 1798, took each of them a table spoonful of sweet oil every morning. They both escaped the fever. Did the oil, in these cases, act by destroying miasmata in the stomach chemically? or did it defend the stomach mechanically from their action? or did it prevent the disease, only by gently opening the bowels? It is certain the fat of pork meat protects the men who work in the lead mines of Great-Britain from the deleterious effects which

the fumes of that metal are apt to bring upon the stomach and bowels, and that a poisoned arrow, discharged into the side of a hog, will not injure him, if it be arrested by the fat which lines that part of his body.

The vapours which issue from fresh earth has been supposed to destroy the miasmata which produce malignant fevers, by entering into mixture with them. Most of the men who were employed in digging graves and cellars, and in removing the dirt from the streets of Philadelphia, in 1793, escaped the fever of that year. In the new settlements of our country, it is said, the poison of the rattle snake is deprived of its deadly effects upon the body, by thrusting the wounded limb into a hole recently made in the earth. The fable of Anteus who rose with renewed strength from the ground after repeated falls, was probably intended to signify, among other things, the salutary virtues which are contained in the effluvia which issue from fresh clods of earth.

3. There are many facts which show the efficacy of the volatile alkali in destroying, by mixture, the poison of snakes. One of them was lately communicated to the public by Dr. Ramsay, of South-Carolina. What would be the effect of the daily use of a few tea-spoonfuls of this medicine in a liquid form, and of frequently washing the body with it, during the prevalence of pestilential epidemics?

The miasmata which produce malignant fevers often exist in an offensive state in the body, for weeks and perhaps months, without doing any harm. With but a few exceptions, they seldom induce a disease without the reinforcement of an exciting cause. In vain, therefore, shall we use all the preventives that have been recommended, without,

V. Avoiding of all its exciting causes. These are,

1. Heat and cold. While the former has excited the yellow fever in thousands, the latter has excited it in tens of thousands. It is not in middle latitudes only that cold awakens this disease in the body. Dr. Mosely says it is a more frequent exciting cause of that, and of other diseases, in the island of Jamaica, than in any of the most temperate climates of the globe. It is this which

renders cases of yellow fever, when epidemic in our cities, more numerous in the cool months of September and October, than in July and August. For the purpose of avoiding this pernicious and universal influence of cold, the clothing and bed-covers should be rather warmer in those months, in middle and northern latitudes, than is agreeable, and fires should be made every morning and evening in common sitting rooms, and during the whole day, when the weather is damp or cool. They serve not only to prevent the reduction of the excitement of the blood-vessels, by the gradual and imperceptible abstraction of the heat of the body, but to convey up a chimney all the unwholesome air that accumulates in those rooms during a sickly season. By these precautions, I have known whole families preserved in health, while all the neighbours who neglected them, have been confined by a prevailing autumnal fever.

3. The early morning and evening air, even in warm weather.

4. Fatigue from amusements, such as fishing, gunning and dancing, and from *unusual* labour or exercise. The effects of fatigue from this cause have been already noticed,* in the maids of large families being the only persons who die of the fever, in consequence of their having performed great and *unusual* services to those branches of the family who survive them, while nurses, who only exercise their ordinary habits in attending sick people, are seldom carried off by it.

5. Intemperance in eating and drinking.

6. Partaking of *new* aliments and drinks. The stomach, during the prevalence of malignant fevers, is always in an irritable state, and constantly disposed to be affected by impressions that are not habitual to it.

7. Violent emotions or passions of the mind.

8. The entire cessation of moderate labour. This, by permitting the mind to ramble upon subjects of terror and distress, and by exposing the body to idleness and company, favours an attack of fever. A predisposition to it, is likewise created by alternating labour and idleness, with each other.

* Account of the Yellow Fever in 1793, vol. iii.

6. The continuance of hard labour. The miasmata which produce malignant fevers sometimes possess so much force, that the least addition to it, even from customary acts of labour, is sufficient to excite the disease. In this case, safety should be sought in retirement, more especially by those persons whose occupations expose them to the heat of fires, and the rays of the sun, such as hatters, smiths, bricklayers, and house and ship carpenters. The wealthy inhabitants of Constantinople and Smyrna, erroneously suppose they escape the contagion of the plague, by shutting themselves up in their houses during its prevalence. They owe their preservation chiefly to their being removed, by an exemption from care and business, from all its exciting causes. Most of the nobility and gentry of Moscow, by these means escaped a plague which carried off 27,000 persons in that city, in the year 1771, and many whole families in Philadelphia were indebted for their safety to the same precautions in the year 1793. Confinement is more certain in its beneficial effects, when persons occupy the upper stories only of their houses. The inhabitants of St. Lucia, Dr. Chisholm says, by this means often escape the yellow fever of that island. Such is the difference between the healthiness of the upper and lower stories of a house, that travellers tell us, birds live in the former, and die in the latter, during the prevalence of a plague in the eastern countries. But the benefits of confinement and rest, are by no means general in preserving persons from the plague and yellow fever. Some late accounts from Egypt, teach us that an atmosphere infected with putrid miasmata sometimes penetrates into the retreats of the wealthy and the timid, and spreads with its usual mortality among them. Solitary instances of the same thing have occurred in Philadelphia, in families which have lived in retirement during the prevalence of the yellow fever.

All the exciting causes that have been enumerated should be avoided with double care three days before, and three days after, as well as on the days of the full and change of the moon. The reason for this caution

was given in the account of the yellow fever in Philadelphia in the year 1797.

To persons who had retired from infected cities, or countries, it will be necessary to suggest a caution, not to visit them while the malignant fever from which they fled prevails in them. Dr. Dow informed me, in his visit to Philadelphia in the year 1800, that the natives and old citizens of New-Orleans who retired into the country, and returned during the prevalence of the yellow fever in that city, the year before, were often affected by it, while all such persons as did not change their residence, escaped it. The danger from visiting an infected city is greater to persons who breathe an atmosphere of a uniform temperature, than one that is subject to alternate changes in its degrees of heat and cold. The inhabitants of Mexico, Baron Humboldt informed me, who descend from their elevated situation, where the thermometer seldom varies more than ten degrees in the year, and visit Vera Cruz during the prevalence of the yellow fever in that city, are much oftener affected by it than the new comers from the variable climates of European countries. But the habits of insensibility to the impressions of the miasmata of this disease in one country, do not always protect the system from their action in another. The same illustrious traveller informed me, that the inhabitants of the Havannah who visit Vera Cruz, and the inhabitants of Vera Cruz who visit the Havannah, are affected in common with strangers with the fever of those places.

I shall take leave of this part of our subject, by adding, that I am so much impressed with a belief in the general, and almost necessary connection of an exciting cause with a yellow fever, that were I to enter a city, and meet its inhabitants under the first impressions of terror and distress from its appearance, my advice to them should be, "BEWARE," not of contagion, for the yellow fever of our country is not contagious, nor of putrid exhalations, where the duties of humanity or consanguinity require your attendance, but "BEWARE OF EXCITING CAUSES!"

In the mild grades of the summer and autumnal fevers of the United States, the means of prevention should be different from those which have been recommended to prevent the yellow fever. They consist of such things as gently invigorate the system, and thus create an action superior to that which the miasmata have excited in it. The means commonly employed for this purpose are,

1. Cordial diet and drinks; consisting of salted meat, and fish, with a moderate quantity of wine and malt liquors. Dr. Blane says, the British soldiers who lived upon salt meat, during the American war, were much less afflicted with the intermitting fever, than the neighbouring country people; and, it is well known, the American army was much less afflicted with summer and autumnal fevers, after they exchanged their fresh meat, for rations of salted beef and pork. Ardent spirits should be used cautiously, for, when taken long enough to do good, they create a dangerous attachment to them. A strong infusion of any bitter herb in water, taken upon an empty stomach, is a cheap substitute for all the above liquors where they cannot be afforded. The Peruvian bark has in many instances been used with success as a preventive of the mild grades of the summer and autumnal fevers of our country.

2. An equable and constant perspiration. This should be kept up by all the means formerly mentioned for that purpose.

3. Avoiding certain exciting causes, particularly great heat and cold, fatigue, long intervals between meals, intemperance, and the morning and evening air, more especially during the lunar periods formerly mentioned. Dr. Lind says, the farmers of Holderness, in England, who go out early to their work, are seldom long lived, probably from their constitutions being destroyed by frequent attacks of intermitting fevers to which that practice exposes them. Where peculiar circumstances of business render it necessary for persons to inhale the morning air, care should be taken never to do it without first eating a cordial breakfast.

The *intestinal* state of our summer and autumnal disease requires several specific means to prevent it, different

from those which have been advised to defend the blood-vessels from fever. Unripe and decayed fruit should be avoided, and that which is ripe and sound should not be eaten in an excessive quantity. Spices, and particularly Cayenne pepper, and the red pepper of our country, should be taken daily with food. Mr. Dewar, a British surgeon, tells us, the French soldiers, while in Egypt, carried pepper in boxes with them, wherever they went, to eat with the fruits of the country, and thereby often escaped its diseases. The whole diet, during the prevalence of intestinal diseases, when they are not highly inflammatory, should be of a cordial nature. A dysentery prevailed, a few years ago, upon the Potomac, in a part of the country which was inhabited by a number of protestant and catholic families. The disease was observed to exist only in the former. The latter, who ate of salted fish every Friday, and occasionally on other days of the week, very generally escaped it. In the year 1759, a dysentery broke out in the village of Princetown, in New-Jersey, and affected many of the students of the college. It was remarked, that it passed by all those boys who came from the cities of New-York and Philadelphia. This was ascribed to their having lived more upon tea and coffee than the farmers' sons in the college; for those cordial articles of diet were but rarely used, fifty years ago, in the farm houses of the middle states of America. I mentioned formerly that the cordial diet of the inhabitants of our cities was probably the reason why the dysentery so seldom prevailed as an epidemic in them.

Another means of preventing the dysentery is, by avoiding costiveness, and by occasionally taking purging physic, even when the bowels are in their natural state. A militia captain, in the Pennsylvania service, preserved his whole company from a dysentery which prevailed in a part of the American army at Amboy, in the year 1776, by giving each of them a purge of sea-water. He preserved his family, and many of his neighbours, some years afterwards, from the same disease, by dividing among them a few pounds of purging salts. It was prevented, a few years ago, in the academy of Bordentown, in New-Jersey, by giving all the boys molasses, in large quantities, in their

diet and drinks. The molasses probably acted only by keeping the bowels in a laxative state.

As the dysentery is often excited by the dampness of the night air, great care should be taken to avoid it, and, when necessarily exposed to it, to defend the bowels by more warmth than other parts of the body. The Egyptians, Mr. Dewar says, tie a belt about their bowels for that purpose, and with the happiest effects.

II. I come now, according to the order I proposed, to mention the means of preserving whole cities or communities from the influence of those morbid exhalations which produce the different forms of summer and autumnal disease, and, in particular, that which is of a malignant nature.

As the flight of a whole city is rarely practicable, it will be necessary to point out the means of destroying the morbid miasmata.

1. Where the putrid matters which emit them are of a small extent, they should be covered with water or earth. Purchas tells us, 500 persons less died of the plague the day after the Nile overflowed the ground which had emitted the putrid exhalations that produced it, than had died the day before. A bilious fever was once checked in Brabant by inundating the marsh from whence the miasmata came that produced it. During the prevalence of a malignant fever, it will be unsafe to remove putrid matters. A plague was generated by an attempt to remove the filth which had accumulated on the banks of the waters which surround the city of Mantua, during the summer and autumnal months.* Even a shower of rain, by disturbing the green pellicle which is sometimes formed over putrid matters, I shall mention in another place, has let loose exhalations that have produced a pestilential disease.

2. Impregnating the air with certain effluvia, which act either by destroying miasmata by means of mixture, or by exciting a new action in the system, has, in some instances, checked the progress of a malignant fever. The air extricated from fermenting wines, during a plentiful vintage, Vansweiten tells us, has once checked the rava-

* BURSELIUS.

ges of a plague in Germany. Ambrose Parey informs us, the plague was checked in a city in Italy by killing all the cats and dogs in the place, and leaving them to putrefy in the streets. Mr. Bruce relates, that all those persons who lived in smoky houses, in one of the countries which he visited, escaped bilious fevers, and Dr. Clark mentions an instance, in which several cooks, who were constantly exposed to smoke, escaped a fever which affected the whole crew of a galley. The yellow fever has never appeared within the limits of the effluvia of the sal ammoniac manufactory, nor of the tan-pits in the suburbs of Philadelphia, nor has the city of London been visited with a plague since its inhabitants have used sea-coal for fuel. But other causes have contributed more certainly to the exemption of that city from the plague for upwards of a century, one of which shall be mentioned under our next head.

3. Desquenette tells us, the infection of the plague never crosses the Nile, and that it is arrested by means of ditches, dug and filled with water for that purpose. Dr. Whitman has remarked, that the plague never passes from Abydos, on the Turkish, to Mito, on the European side of the water of the Dardanelles, which forms the entrance to Constantinople. The yellow fever has never been known to pass from Philadelphia to the Jersey shore, and the miasmata generated on the east side of the Schuylkill rarely infect the inhabitants of the opposite side of the river. Many persons found safety from the plague of London, in 1665, by flying to ships which lay in the middle of the Thames, and, it is well known, no instances of yellow fever occurred in those Philadelphia families that confined themselves to ships in the middle of the Delaware, in the year 1793. But three or four, of four hundred men, on board a ship of war called the Jason, commanded by captain Coteneuil, perished with an epidemic yellow fever, in the year 1746, at St. Domingo, in consequence, Dr. Desportes says, of her hold being constantly half filled with water.* I have multiplied facts upon this subject, because they lead to important conclusions. They show the immense consequence of frequently washing the streets and houses of cities, both to

* Vol. i p 161.

prevent and check pestilential fevers. What would be the effect of placing tubs of fresh water in the rooms of patients infected with malignant fevers, and in an atmosphere charged with putrid exhalations? Their efficacy in absorbing the matter which constitutes the odour of fresh paint, favours a hope that they would be useful for that purpose. I have mentioned an instance, in the Account of the Yellow Fever in Philadelphia, in the year 1797, in which they were supposed to have been employed with evident advantage.

4. Intercepting the passage of miasmata to the inhabitants of cities. Varro in his Treatise upon Agriculture, relates, that his namesake Varro, a Roman general, was in great danger of suffering, with a large fleet and army, from a malignant fever at Conyra. Having discovered the course of the miasmata which produced it to be from the south, he fastened up all the southern windows and doors of the houses in which his troops were quartered, and opened new ones to the north, by which means he preserved them from the fever which prevailed in all the other houses of the town and neighbourhood. Mr. Howard advises keeping the doors and windows, of houses which are exposed to the plague, constantly shut, except during the time of sunshine.

5. Sir John Pringle tells us, that the inhabitants of Breda defend themselves from the morbid exhalations of a piece of marshy ground in its neighbourhood, in the season of bilious fevers, by overflowing it with water.

Several other means have been recommended to preserve cities from malignant fevers during their prevalence, which are of doubtful efficacy, or evidently hurtful. They are,

6. Strewing lime over putrid matters. Dr. Dalzelle says, he once checked a bilious fever, by spreading twelve barrels of lime on a piece of marshy ground, from whence the exhalations that produced it were derived*. A mixture of quick lime and ashes in water, when thrown into a privy, discharges from it a large quantity of offensive air, and leaves it afterwards without a smell. As this foul air is discharged into the atmosphere, it has been

* Sur les Maladies des Climats Chauds.

doubted whether the lime and ashes should be used for that purpose, after a malignant fever had made its appearance.

7. Mr. Quiton Morveau has lately proposed the muriatic gas as a means of destroying miasmata. However effectual it may be in destroying the volatile and foul excretions which are discharged from the human body in confined situations, as in filthy jails, hospitals, and ships; it is not calculated to oppose the seeds of a disease which exists in the atmosphere, and which are diffused over a large extent of city or country. Mr. Morveau ascribes great virtues to it, in checking the malignant fever in Cadiz, in 1801, but from the time at which it was used, being late in the autumn, there is more reason to believe it had run its ordinary course, or that it was destroyed by cold weather.

8. The explosion of gunpowder has been recommended for checking pestilential diseases. Mr. Quiton Morveau says, it destroys the offensive odour of putrid exhalations, but does not act upon the fevers produced by them.

9. Washing the floors of houses with a solution of alkaline salts in water, has been recommended by Dr. Mitchell, as an antidote to malignant fevers. As yet, I believe, there are no facts which establish the efficacy of the practice, when they are produced by exhalations from decayed vegetable and animal substances in a putrid state.

10. Large fires have sometimes been made in cities, in order to destroy the miasmata of pestilential disease. They were obviously hurtful in the plague of London, in the year 1665. Dr. Hodges, who relates this fact, says, "Heaven wept for the mistake of kindling them, and mercifully put them out, with showers of rain."

I cannot conclude this head, without lamenting the want of laws in all our states, to compel physicians to make public the first cases of malignant fever that come under their notice. The cry of fire is not more useful to save a city from destruction, than the early knowledge of such cases would be to save it from the ravages of pestilential and mortal epidemics. Hundreds of instances have occurred in all ages and countries, in which they might

have been stifled in their birth, by the means that have been mentioned, had this practice been adopted. But when, and where, will science, humanity, and government first combine to accomplish this salutary purpose? Most of our histories of mortal epidemics abound with facts which show a contrary disposition and conduct in physicians, rulers, and the people. I shall mention one of these facts only, to show how far we must travel over mountains of prejudice and error, before we shall witness that desirable event. It is extracted from the second volume of the Life of the late Empress of Russia. "The Russian army, (says the biographer,) after defeating the Turks, on entering their territories were met by the plague, and brought it to their country, where the folly of several of their generals contributed to its propagation, as if they thought by a military word of command to alter the nature of things. Lieutenant-general Stoffeln, at Yassy, where the pestilence raged in the winter of 1770, issued peremptory orders that its name should not be pronounced; even he obliged the physicians and surgeons to draw up a declaration in writing, that it was only a *spotted fever*. One honest surgeon of the name of Kluge refused to sign it. In this manner the season of prevention was neglected. Several thousand Russian soldiers were by this means carried off. The men fell dead upon the road in heaps. The number of burghers that died was never known, as they had run into the country, and into the forests. At length the havoc of death reached the general's own people: he remained true to his persuasion, left the town, and went into the more perilous camp. But his intrepidity availed him nothing; he died of the plague in July, 1771."*

III. Let us now consider, in the last place, the means of exterminating malignant and other forms of the summer and autumnal disease, by removing their causes. These means are,

1. The removal or destruction of all those putrid matters formerly enumerated, which are capable of producing fevers. Many of the institutions of the Jewish

* The above disease appears to have been the camp fever, the origin and character of which will be noticed in the next article.

nation, for this purpose, are worthy of our imitation. The following verses contain a fund of useful knowledge upon this subject.—“Thou shalt have a place without the camp, whither thou shalt go forth abroad; and shalt have a paddle upon thy weapon, and it shall be when thou wilt ease thyself abroad, thou shalt dig therewith, and shalt turn back, and cover that which cometh from thee; for the Lord thy God walketh in the midst of thy camp to deliver thee, therefore shall he *see no unclean thing in thee*, and turn away from thee.” Deuteronomy, chapter xxiii. verses 12, 13, and 14. “But the flesh of the bullock, and his skin and his dung, shalt thou *burn with fire without the camp*.” Exodus, chapter xxix. verse 14. The advantages of thus burying and removing all putrid matters, and of burning such as were disposed to a speedy putrefaction, in a crowded camp, and in a warm climate, are very obvious. Their benefits have often been realized in other countries. The United provinces of Holland hold their exemption from the plague, only by the tenor of their cleanliness. In the character given by Luther of Pope Julius, he says, “he kept the streets of Rome so clean and sweet, that there were no plagues nor sickness during his time.” The city of Oxford was prepared to afford an asylum to the royal family of Great-Britain from the plague, when it ravaged London, and other parts of England, in the year 1665, only in consequence of its having been cleaned, some years before, by the Bishop of Winchester. In a manuscript account of the life of Doctor, afterwards Governor Colden, of New-York, there is the following fact. It was first communicated to the public in the daily gazette of the capital of that state, on the 30th of October, 1799. “A malignant fever having raged with exceeding violence for two summers successively in the city of New-York, about forty years ago, he communicated his thoughts to the public, on the most probable cure of the calamity. He published a little treatise on the occasion, in which he collected the sentiments of the best authority, on the bad effects of *stagnating waters, moist air, damp cellars, filthy shores, and dirty streets*. He showed how much these nuisances prevailed in many parts of the city, and pointed out the

remedies. The corporation of the city voted him their thanks, adopted his reasoning, and established a plan for draining and cleaning the city, which was attended with the most happy effects." The advantages of burning offal matters, capable by putrefaction of producing fevers, has been demonstrated by those housekeepers, who, instead of collecting the entrails of fish and poultry, and the parings and skins of vegetables, in barrels, instantly throw them into their kitchen fires. The families of such persons are generally healthy.

2. In the construction of cities, narrow streets and alleys should be carefully avoided. Deep lots should be reserved for yards and gardens for all the houses, and subterraneous passages should be dug to convey, when practicable, to running water, the contents of privies, and the foul water of kitchens. In cities that are wholly supplied with fresh water by pipes from neighbouring springs or rivers, all the evils from privies might be prevented by digging them so deep as to connect them with water. Great advantages, it has been suggested, would arise in the construction of cities, from leaving open squares, equal in number and size to those which are covered with houses. The light and dark squares of a chequer-board might serve as models for the execution of such a plan. The city of London, which had been afflicted nearly every year for above half a century by the plague, has never been visited by it since the year 1666. In that memorable year, while the inhabitants were venting their execrations upon a harmless bale of silks imported from Holland, as the vehicle of the seeds of their late mortal epidemic, Heaven kindly pointed out, and removed its cause, by permitting a fire to destroy whole streets and lanes of small wooden buildings, which had been the reservoirs of filth for centuries, and thereby the sources of all the plagues of that city.* Those streets and lanes were to London, what Water-street and Farmer's-row are to Philadelphia, Fell's-point to Baltimore, the

* A proposal was made to replace the houses that had been burnt, by similar buildings, and upon the same space of ground. Sir Christopher Wren opposed it, and with the following argument; "By so doing, you will show you have not deserved the late fire!"

slips and docks to New-York, and Water-street to the town of Norfolk.

3. Where the different forms of summer and autumnal disease arise from marsh exhalations, they should be destroyed by drains, by wells communicating with their subterraneous springs, or by cultivating upon them certain grasses, which form a kind of mat over the soil, and, when none of these modes of destroying them is practicable, by overflowing them with water.

I have met with many excellent quotations from a work upon this part of our subject, by Tozzetti, an Italian physician, from which, I have no doubt, much useful information might be obtained. The Rev. Thomas Hall, to whom I made an unsuccessful application for this work, speaks of it, in his answer to my letter, in the following terms. "It is in such high estimation that the late emperor Leopold, when grand duke of Tuscany, caused it to be re-printed at his own expense, and presented it to his friends. The consequence of this was, it influenced the owners of low marshy grounds, in the neighbourhood of the river Arno, to drain and cultivate them, and thereby rendered the abode of noxious air, and malignant fevers, a terrestrial paradise."

4. The summer and autumnal diseases of our country have often followed the erection of mill-dams. They may easily be obviated by surrounding those receptacles of water with trees, which prevent the sun's acting upon their shores, so as to exhale miasmata from them. Trees planted upon the sides of creeks and rivers, near a house, serve the same salutary purpose.

5. It has often been observed, that families enjoy good health, for many years, in the swamps of Delaware and North-Carolina, while they are in their natural state, but that sickness always follows the action of the rays of the sun upon the moist surface of the earth, after they are cleared. For this reason, the cultivation of a country should always follow the cutting down of its timber, in order to prevent the new ground becoming, by its exhalations, a source of disease.

6. In commercial cities, no vessel that arrives with a cargo of putrescent articles should ever be suffered to

approach a wharf, before the air that has been confined in her hold has been discharged. The same thing should be done after the arrival of a vessel from a distant or hot country, though her cargo be not capable of putrefaction, for air acquires a morbid quality by stagnating contiguous to wood, under circumstances formerly mentioned.

All these modes of removing the causes of malignant and yellow fevers, and of promoting strict and universal cleanliness, are of more consequence in the middle and northern states of America, than in countries uniformly warm, inasmuch as the disease may be taken as often as our inhabitants are exposed to its sources. In the West-Indies, a second attack of the yellow fever is prevented by the insensibility induced upon the system, by its being constantly exposed to the impressions of heat and exhalation. After a seasoning, as it is called, or a residence of two or three years in those islands, the miasmata affect the old settlers, as they do the natives, only with mild remittents. Nearly the same thing takes place at Madras, in the East-Indies, where Dr. Clark says, the exhalations which bring on bilious fevers, colic, cholera, and spasmodic affections in new comers, produce a puking in the morning, only in old residents. But very different is the condition of the inhabitants of the middle and northern states of America, in whom the winters prevent the acquisition of habits of insensibility to the heat and exhalations of the previous summers, and thus place them every year in the condition of new comers in the West and East-Indies, or of persons who have spent two or three years in a cold climate. This circumstance increases the danger of depopulation from our malignant epidemics, and should produce corresponding exertions to prevent them.

In enumerating the various means of preventing and exterminating the malignant forms of fever, it may appear strange that I have said nothing of the efficacy of quarantines for that purpose. Did I believe these pages would be read only by the citizens of Pennsylvania, I would do homage to their prejudices, by passing over this subject by a respectful and melancholy silence; but as

it is probable they will fall into the hands of physicians and citizens of other states, I feel myself under an obligation to declare, that I believe quarantines of no efficacy in preventing the yellow fever, in any other way than by excluding the unwholesome air that is generated in the holds of ships, which may be done as easily in a single day, as in weeks or months. They originated in error, and have been kept up by a supine and traditional faith in the opinions and conduct of our ancestors in medicine. Millions of dollars have been wasted by them. From their influence, the commerce, agriculture, and manufactures of our country have suffered for many years. But this is not all. Thousands of lives have been sacrificed, by that faith in their efficacy, which has led to the neglect of domestic cleanliness. Distressing as these evils are, still greater have originated from them; for a belief in the contagious nature of the yellow fever, which is so solemnly enforced by the execution of quarantine laws, has demoralized our citizens. It has, in many instances, extinguished friendship, annihilated religion, and violated the sacraments of nature, by resisting even the loud and vehement cries of filial and parental blood.

While I thus deny the yellow fever to be the offspring of a specific contagion, and of course incapable of being imported so as to become an epidemic in any country, I shall admit presently, that the excretions of a patient in this disease may, by confinement, become so acrid as to produce, under circumstances to be mentioned hereafter, a similar disease, in a person, but from this person it cannot be communicated, if he possess only the common advantages of pure air and cleanliness. To enforce a quarantine law, therefore, under such a contingent circumstance, and at the expense of such a profusion of blessings as have been mentioned, is to imitate the conduct of a man, who, in attempting to kill a fly upon his child's forehead, knocked out his brains.

From the detail that has been given of the sources of malignant fevers, and of the means of preventing them, it is evident that they do not exist by an unchangeable law of nature, and that Heaven has surrendered every part of the globe to man, in a state capable of being in-

habited, and enjoyed. The facts that have been mentioned show farther, the connection of health and longevity, with the reason and labour of man.

To every natural evil the Author of Nature has kindly prepared an antidote. Pestilential fevers furnish no exception to this remark. The means of preventing them are as much under the power of human reason and industry, as the means of preventing the evils of lightning and common fire. I am so satisfied of the truth of this opinion, that I look for the time when our courts of law shall punish cities and villages, for permitting any of the sources of bilious and malignant fevers to exist within their jurisdiction.

I have repeatedly asserted the yellow fever of the United States not to be contagious. I shall now mention the proofs of that assertion, and endeavour to explain instances of its supposed contagiousness upon other principles.

FACTS,
INTENDED TO PROVE
THE YELLOW FEVER
NOT TO BE CONTAGIOUS.

FACTS, &c.

WHEN fevers are communicated from one person to another, it is always in one of the following ways.

1. By secreted matters. 2. By excreted matters. The small-pox and measles are communicated in the former way; the jail, or, as it is sometimes called, the ship, or hospital fever, is communicated only by means of the excretions of the body. The perspiration, by acquiring a morbid and irritating quality more readily than any other excretion, in consequence of its stagnation and confinement to the body in a tedious jail fever, is the principal means of its propagation. The perspiration* is, moreover, predisposed to acquire this morbid and acrid quality by the filthiness, scanty, or bad aliment, and depression of mind, which generally precede that fever. It is confined to sailors, passengers, soldiers, prisoners, and patients, in foul and crowded ships, tents, jails, and hospitals, and to poor people who live in small, damp, and confined houses. It prevails chiefly in cool and cold weather, but is never epidemic; for the excreted matters which produce the fever do not float in the external atmosphere, nor are they communicated, so as to produce disease, more than a few feet from the persons who exhale them. They are sometimes communicated by means of the clothes which have been worn by the sick, and there have been instances in which the fever has been produced by persons who had not been confined by it, but who had been previously exposed to all the causes which generate it. It has been but little known in the United States since the revolutionary war, at which time it prevailed with great mortality in the hospitals and camps of the American army. It has now and then appeared in ships that were crowded with passengers from

* The deleterious nature of this fluid, and its disposition to create disease, under the above circumstances, has been happily illustrated by Dr. Mitchill, in an ingenious letter to Dr. Duncan, of Edinburgh, published in the fourth volume of the *Annals of Medicine*.

different parts of Europe. It is a common disease in the manufacturing towns of Great-Britain, where it has been the subject of several valuable publications, particularly by Dr. Smith, and Dr. John Hunter. Dr. Haygarth has likewise written upon it, but he has unfortunately confounded it with the West-India and American yellow fever, which differs from it in prevailing chiefly in warm climates and seasons; in being the offspring of dead and putrid vegetable and animal matters; in affecting chiefly young and robust habits; in being generally accompanied with a diseased state of the stomach, and an obstruction or preternatural secretion and excretion of bile: in terminating, most commonly, within seven days; in becoming epidemic *only* by means of an impure atmosphere; and in not furnishing ordinarily those excretions which, when received into other bodies, reproduce the same disease.

I have been compelled to employ this tedious description of two forms of fever, widely different from each other in their causes, symptoms, and duration, from the want of two words which shall designate them. Dr. Miller has boldly and ingeniously proposed to remedy this deficiency in our language, by calling the former *idio-miasmatic*, and the latter *koino-miasmatic* fevers, thereby denoting their *private* or *personal* and their *public* or *common* origin.* My best wishes attend the adoption of those terms!

I return to remark, that the yellow fever is not contagious in its simple state, and that it spreads exclusively by means of exhalations from putrid matters, which are diffused in the air. This is evident from the following considerations:

1. It does not spread by contagion in the West-Indies. This has been proved in the most satisfactory manner by Drs. Hillary, Huck, Hunter, Hector, M'Lean, Clark, Jackson, Borland, Pinckard, and Scott. Dr. Chisholm stands alone, among modern physicians, in maintaining a contrary opinion. It would be easy to prove, from many passages in the late edition of the doctor's learned and instructive volumes, that he has been mistaken; and that

* Medical Repository, hexade ii. vol. i.

the disease was an endemic of every island in which he supposed it to be derived from contagion. A just idea of the great incorrectness of all his statements, in favour of his opinion, may be formed from the letter of J. F. Eckard, Esq. Danish consul, in Philadelphia, to Dr. James Mease, published in a late number of the New-York Medical Repository.*

2. The yellow fever does not spread in the country, when carried thither from the cities of the United States.

3. It does not spread in yellow fever hospitals, when they are situated beyond the influence of the impure air in which it is generated.

4. It does not spread in cities (as will appear hereafter) from any specific matter emitted from the bodies of sick people.

5. It generally requires the co-operation of an *exciting* cause, with miasmata, to produce it.—This is never the case with diseases which are universally acknowledged to be contagious.

6. It is not propagated by the artificial means which propagate contagious diseases. Dr. Ffirth inoculated himself above twenty times, in different parts of his body, with the black matter discharged from the stomach of patients in the yellow fever, and several times with the serum of the blood, and the saliva of patients ill with that disease, without being infected by them; nor was he indisposed after swallowing half an ounce of the black matter recently ejected from the stomach, nor by exposing himself to the vapour which was produced by throwing a quantity of that matter upon iron heated over a fire.†

To the first four of these assertions there are some seeming exceptions in favour of the propagation of this fever by contagion. I shall briefly mention them, and endeavour to explain them upon other principles.

The circumstances which seem to favour the communication of the yellow fever from one person to another,

* For February, March, and April, 1804.

† Inaugural Dissertation on Malignant Fever, &c. published in June, 1804.

by means of what has been supposed to be contagions, are as follows:

1. A patient being attended in a small, filthy, and *close* room. The excretions of the body, when thus accumulated, undergo an additional putrefactive process, and acquire the same properties as those putrid animal matters which are known to produce malignant fevers. I have heard of two or three instances in which a fever was produced by these means in the country, remote from the place where it originated, as well as from every external source of putrid exhalation. The plague is sometimes propagated in this way in the low and filthy huts which compose the alleys and narrow streets of Cairo, Smyrna, and Constantinople.

2. A person sleeping in the sheets, or upon a bed impregnated with the sweats or other excretions, or being exposed to the smell of the foul linen, or other clothing of persons who had the yellow fever. The disease here, as in the former case, is communicated in the same way as from any other putrid animal matters. It was once received in Philadelphia from the effluvia of a chest of unwashed clothes, which had belonged to one of our citizens who had died with it in Barbadoes; but it extended no farther in a large family, than to the person who opened the chest. I have heard of but two instances more of its having been propagated by these means in the United States, in which case the disease perished with the unfortunate subjects of it.

To the above insulated cases of the yellow fever being produced by the clothing of persons who had died of it, I shall oppose a fact communicated to me by Dr. Mease. While the doctor resided at the lazaretto, as inspector of sickly vessels, between May, 1794, and the same month in 1793, the clothing contained in the chests and trunks of all the seamen and others, belonging to Philadelphia, who had died of the yellow fever in the West-Indies, or on their passage home, and the linen of all the persons who had been sent from the city to the lazaretto with that disease, amounting in all to more than one hundred, were opened, exposed to the air, and washed, by the fam-

ily of the steward of the hospital, and yet no one of them contracted the least indisposition from them.

I am disposed to believe the linen, or any other clothing of a person in good health that had been strongly impregnated with sweats, and afterwards suffered to putrefy in a confined place, would be more apt to produce a yellow fever in a summer or autumnal month, than the linen of a person who had died of that disease, with the usual absence of a moisture on the skin. The changes which the healthy excretions by the pores undergo by putrefaction, may easily be conceived, by recollecting the offensive smell which a pocket handkerchief acquires that has been used for two or three days to wipe away the sweat of the face and hands in warm weather.*

3. The protraction of a yellow fever to such a period as to dispose it to assume the symptoms, and to generate the peculiar and highly volatilised exhalation from the pores of the skin which takes place in the jail fever. I am happy in finding I am not the author of this opinion. Sir John Pringle, Dr. Monro, and Dr. Hillary, speak of a contagious fever produced by the combined action of marsh and human miasmata. The first of those physicians supposes the Hungarian bilious fever, which prevailed over the continent of Europe in the seventeenth century, was sometimes propagated in this way, as well as by marsh and other putrid exhalations. Dr. Richard Pearson, in his observations upon the bilious fevers which prevailed in the neighbourhood of Firmingham, in England, in the years 1797, 1798, and 1799, has the following remark: "In its first stage, this fever did not appear to be contagious, but it evidently was so after the eleventh and fourteenth day, when the *typhoid* state was induced†." As this protracted state of bilious fever rarely occurs in our country, it has seldom been communicated in this way.

It is not peculiar, I believe, to a bilious and yellow fever, when much protracted beyond its ordinary duration to put on the symptoms of the jail fever. The same appearances occur in the pleurisy, and in other, of what Dr.

* See Van Sweiten on Epidemic Diseases, Aphorism 1408.

† Page 13.

Sydenham calls *intercurrent* fevers, all of which I have no doubt, under certain circumstances of filth, confinement, and long duration, would produce a fever in persons who were exposed to it. This fever, if the weather were cold, would probably put on inflammatory symptoms, and be added, in our nosologies, to the class of contagious diseases.

From the necessary influence of time, in thus rendering fevers of all kinds now and then contagious by excretion, it follows, that the yellow fever, when of its usual short duration, is incapable of generating that excretion, and that, instead of being considered as the only form of bilious fever that possesses a power of propagating itself, it should be considered as the only one that is devoid of it.

4. Miasmata, whether from marshes, or other external sources, acting upon a system previously impregnated with the excreted matters which produce the jail or ship fever. Mr. Lempriere informs us, that he saw what were supposed to be cases of yellow fever communicated by some sailors who brought the seeds of the ship fever with them to the island of Jamaica. The fevers which affected most of the crews of the Hussar frigate, mentioned by Dr. Trotter*, and of the Busbridge Indiaman, described by Mr. Bryce†, appear to have been the effect of the combined operations of foul air in those ships, and human excretions, upon their systems. The disease was barely tinged with bilious symptoms, and hence the facility with which it was cured, for the jail fever more readily yields to medicine than the yellow fever. The former was probably excited by some latent exhalation from dead matters in the holds of the ships, and hence we find it ceased on shore, where it was deprived of its exciting cause. It is true, great pains were taken to clean the hold and decks of the Busbridge, but there are foul matters which adhere to the timbers of ships, and which, according to Dr. Lind, are sometimes generated by those timbers when new, that are not to be destroyed by any of the common means employed for that purpose. Of this Dr. Kollock has furnished us with a most satisfactory proof, in his

* Medicina Nautica, p. 360.

† Annals of Medicine, vol. i. p. 116.

history of the yellow fever. which prevailed on board of the frigate General Greene, on her voyage to the Havanna, in the year 1799. "The air in the hold of the vessels (says the doctor) was so contaminated, as to extinguish lights immediately, and candles in the cockpit were almost as useless from the same cause. The fish were thrown overboard, and the decks washed and scoured, the ventilator and wind sails put in motion, and every measure of purification adopted that their situation allowed; notwithstanding these precautions disease invaded us. The men were unceasing in their exertions to purify the ship; washing, scouring with vinegar, burning powder and vinegar, old junk, and sulphur, added to constant ventilation, proved unequal even to the amelioration of their calamities, while they were in the latitude of *great heat*. After the removal of the sick, the ship was disburthened of her stores, ballast, &c. cleansed and white-washed throughout; still new cases occurred for nearly two months. Some days, two, three, or four were sent off to the hospital, which would seem to indicate the retention of some portion of this noxious principle, which was lodged beyond the reach of the cleansing process." That this noxious principle of matter existed in the ship, and not in the bodies of the crew, is evident from its not having been communicated, in a single instance, by a hundred of them who were sent to an hospital on Rhode-Island, notwithstanding an intercourse sufficient to propagate it was necessarily kept up with the inhabitants. Even their nurses did not take it.*

5. A fifth instance in which contagion has been supposed to take place in the yellow fever is, where the exhalation from the excretions of a patient in that disease acts as an *exciting* cause, in persons previously impregnated with the marsh, or other external miasmata, which produce it. The activity of this exhalation, even when it is attended with no smell, is so great, as to induce sickness, head-ach, vertigo, and fainting. It is not peculiar to the exhalations from such patients to produce morbid effects upon persons who visit them. The odour emitted by persons in the confluent small-pox has been

known to produce the same symptoms together with a subsequent fever and apthous sore throat. This has been remarked long ago by Dr. Lind, and latterly by Dr. Willan, in his Reports of the diseases of London.* That the yellow fever is often excited in this way, without the intervention of a supposed specific contagion, I infer from its sometimes spreading through whole families, who have breathed the same impure atmosphere with the person first infected by the fever. This is more especially the case where the impression made by the exhalation from the sick person is assisted by fear, fatigue, or anxiety of mind in other branches of the family. In favour of this mode of exciting the yellow fever, Dr. Otto communicated to me the following fact. In the autumn of the year 1798, it prevailed upon the *shores* of the Delaware, in Gloucester county, in New-Jersey. A mild remittent prevailed at the same time on *high* grounds, a few miles from the river. During this time, the Doctor observed, if a person who had inhaled the seeds of the yellow fever in Philadelphia afterwards came into a family *near* the river, the same disease appeared in several instances in one, or more branches of that family; but where persons brought the fever from the city, and went into a family on the *high* grounds, where the mild remittents prevailed, there was not a single instance of a yellow fever being excited by them in any of its members. This fact is important, and of extensive application. It places the stimulus from the breath, or other exhalations of persons affected by the yellow fever, upon a footing with intemperance, fatigue, heat, and all the common exciting causes of the disease; none of which, it is well known, can produce it, except in persons who have previously inhaled the putrid miasmata, which in all countries are its only remote cause. The city of Philadelphia has furnished, in all our yellow fever years, many additional proofs of the correctness of Dr. Otto's remark. In the months of July and August, when miasmata are generally local, and float chiefly near to their hot beds, the docks and holds of ships, persons who are affected by these miasmata, and sicken in other parts of the city, never communicate the

* Page 13 and 113.

disease; but after the less prepared and heterogeneous filth of our whole city has been acted on by an autumnal, as well as summer sun, so as to emit pestilential exhalations in all our streets and alleys, the fever is now and then excited in the manner that has been mentioned by a single person in a whole family. The common intermittents of the southern states are often excited in the same way, without being suspected of spreading by contagion. Even the jail or hospital fever is vindicated by Dr. Hunter from the highly contagious nature which has been ascribed to it, upon the same principle. His words, which are directly to my purpose, are as follows: "In considering the extent and power of the contagion [meaning of the jail or hospital fever,] I am not inclined to impute to this cause the fevers of all those who are taken ill in one family after the first, as they are all along exposed to the same vitiated air which occasions the first fever. In like manner, when a poor woman visits some of her sick neighbours, and is taken ill herself, and afterwards some of her children, I would not impute the disease to infection alone; she and her family having previously lived in the same kind of vitiated air which originally produced the fever. If the cases in which the infection meets with the poison already *half formed* be excepted, the disease in itself will be found to be much less infectious than has been commonly supposed.*" By the modes of communicating the yellow fever which have been admitted, the dysentery, and all the milder forms of autumnal fevers, have been occasionally propagated, and perhaps oftener than the first-named disease, from their being more apt to run on to the typhus or chronic state. Of this I could adduce many proofs, not only from books, but from my own observations; but none of these diseases spread by contagion, or become epidemic from that cause in any country. A contrary opinion, I know, is held by Dr. Cleghorn, and Dr. Clarke; but they have deceived themselves, as they formerly deceived me, by not attending to the difference between secreted contagious and morbid excretions from the body, produced by the causes which have been enume-

* Medical Transactions, vol. iii. p. 351.

rated, and which are rare and accidental concomitants of bilious or summer diseases.

6. The last instance of supposed contagiousness of the yellow fever is said to arise from the effluvia of a putrid body that has died of that disease. The effluvia in this case act either as the putrefied excretions mentioned under the first head, or as an exciting cause upon miasmata, previously received into the system. A dead body, in a state of putrefaction from any other disease, would produce, under the same circumstances of season and predisposition, the same kind and degrees of fever.

The similarity of the fever induced by the means that have been enumerated, with the fever from which it was derived, has been supposed to favour the opinion of its being communicated by a specific contagion. But let it be recollected that the yellow fever is at the time of its being supposed to be thus received, the reigning epidemic, and that irritants of all kinds necessarily produce that disease. The morbid sweats which now and then produce an intermitting fever, and the alvine excretions which occasionally produce a dysentery, act only by exciting morbid actions in the system, which conform in their symptoms to an immutable and universal law of epidemics. It is only when those two diseases generally prevail, that they seem to produce each other.

Thus have I explained all the supposed cases of the contagiousness of the yellow fever. To infer from the solitary instances of it thus excited, is to reason as incorrectly as to say the small-pox is not contagious, because we now and then meet with persons who cannot be infected by it.

From the explanation that has been given of the instances in which the yellow fever has been supposed to spread by contagion, we are compelled to resort to certain noxious matters in the atmosphere, as the exclusive causes of the prevalence, not only of that fever, but (with a few exceptions) of all other epidemic diseases. It is true, we are as yet ignorant of the precise nature of those matters in the air which produce epidemics; but their effects are as certainly felt by the human body as the effects of heat, and yet who knows the nature of that great and universal principle of activity in our globe?

That the yellow fever is propagated by means of an impure atmosphere, at all times, and in all places, I infer from the following facts :

1. It appears only in those climates and seasons of the year in which heat, acting upon moist animal and vegetable matters, fills the air with their putrid exhalations. A vertical sun, pouring its beams for ages upon a dry soil; and swamps, defended from the influence of the sun by extensive forests, have not, in a single instance, produced this disease.

2. It is unknown in places where a connection is not perceptible between it, and marshes, mill-ponds, docks, gutters, sinks, unventilated ships, and other sources of noxious air. The truth of this remark is established by the testimonies of Dr. Lind and Dr. Chisholm, and by many facts in Lempriere's excellent History of the Diseases of Jamaica. Dr. Davidson furnished me with a striking confirmation of their remarks, in the following extract from a letter, dated November 12th, 1794. "I have mentioned (says the doctor) an instance of the remarkable good health which the 66th regiment enjoyed at St. Vincents for several years, upon a high hill above the town, removed from all exhalations, and in a situation kept at all times cool by the blowing of a constant trade wind. They did not lose, during eighteen months, above two or three men (the regiment was completed to the peace establishment,) and during eight years they lost but two officers, one of whom, the quarter-master, resided constantly in town, and died from over fatigue; the other arrived very ill from Antigua, and died within a few days afterwards."

In the United States, no advocate for the specific nature or importation of the yellow fever, has ever been able to discover a single case of it beyond the influence of an atmosphere rendered impure by putrid exhalations.

It is no objection to the truth of this remark, that malignant bilious fevers sometimes appear upon the summits of hills, while their declivities and the vallies below, are exempted from them. The miasmata, in all these cases, are arrested by those heights, and are always to be traced to putrefaction and exhalation in their neighbourhood. Nor is it any objection to

the indissoluble connection between putrid exhalations and the yellow fever, which has been mentioned, that the disease sometimes appears in places remote from the source of miasmata in *time* and *place*. The bilious pleurisies, which occur in the winter and spring, after a sickly autumn, prove that they are retained in the body for many months, and although they are sometimes limited in their extent to a single house, and often to a village, a city, and the banks of a creek or river, yet they are now and then carried to a much greater distance. Mr. Lempriere, in his valuable Observations upon the Diseases of the British Army in Jamaica, informs us, that Kingston is sometimes rendered sickly by exhalations from a lagoon, which lies *nine* miles to the eastward of that town.* The greater or less distance, to which miasmata are carried from the place where they are generated, appears to depend upon their quantity, upon the force and duration of currents of wind which act upon them, and upon their being more or less opposed by rivers, woods, water, houses, wells, or mountains.

3. It is destroyed, like its fraternal diseases, the common bilious and intermitting fevers, by means of *long-continued* and *heavy* rains.† When rains are heavy, but of short duration, they suspend it only in warm weather, but when they are succeeded by cold weather they destroy all the forms of bilious fever. The malignant tertians, described by Dr. Cleghorn, always ceased about the autumnal equinox; for at that time, says the Doctor, "Rain falls in such torrents as to tear up trees by the roots, carry away cattle, break down fences, and do considerable mischief to the gardens and vineyards; but, after a long and scorching summer, they are very acceptable and beneficial, for they mitigate the excessive heat of the air, and give a check to epidemical diseases."‡ There are facts, however, which would seem to contradict the assertion that miasmata are suspended or destroyed by heavy rains. Dr. Lind, in his Treatise upon the Diseases of Hot Climates, mentions instances in which they suddenly created fevers. It is probable, in these cases the rains may have had that effect, by

* Vol. i. page 84.

† Clarke on the Diseases of Long Voyages to Hot Climates, page 116.

‡ Diseases of Minorca, p. 8.

disturbing the pellicle which time often throws over the surface of stagnating pools of water, and putrid matters on dry land. I was led to entertain this opinion by a fact mentioned in a letter I received from Dr. Davidson, dated November 4th, 1794. "Being ordered (says the doctor) up to Barbadoes, last November, upon service, I found that the troops had suffered considerably by that formidable scourge, the yellow fever. The season had been remarkably dry. It was observed, a rainy season contributed to make the season healthier, excepting at Constitution-Hill, where the sixth regiment was stationed, and where a heavy shower of rain seldom failed to bring back the fever, after it had ceased for some time. I found the barrack, where this regiment was, surrounded by a pond of brackish water, which being but imperfectly drained by the continuance of the drought, the surface was covered with a green scum, which prevented the exhalation of marshy putrefaction. After a heavy shower of rain, this scum was broken, and the miasmata evolved, and acted with double force, according to the time of their secretion."

4. It is completely destroyed by frost. As neither rains nor frosts act in sick rooms, nor affect the bodies of sick people, they must annihilate the disease by acting exclusively upon the atmosphere. Very different in their nature are the small-pox and measles, which are propagated by specific contagion. They do not wait for the suns of July or August, nor do they require an impure atmosphere, or an exciting cause, to give them activity. They spread in the winter and spring, as well as in the summer and autumnal months: wet and dry weather do not arrest their progress, and frost, (so fatal to the yellow fever,) by rendering it necessary to exclude cold air from sick rooms, increases the force of their contagion, and thereby propagates them more certainly through a country.

5. It is likewise destroyed by intense heat, and high winds. The latter, we are sure, like heavy rains and frost, do not produce that salutary effect by acting upon the bodies, or in the rooms of sick people.

It is worthy of notice, that while the activity of miasmata is destroyed by cold, when it desends to frost; by heat, when it is so intense as to dry up all the sources of

putrid exhalation; by heavy rains, when they are succeeded by cool weather; and by high winds, when they are not succeeded by warm weather; they are rendered more active by cool, warm, and damp weather, and by light winds. The influence of damp weather, in retaining and propagating miasmata, will be readily admitted, by recollecting how much more easily hounds track their prey, and how much more extensively odours of all kinds pervade the atmosphere, when it is charged with moisture, than in dry weather.

It has been asked, if putrid matters produce malignant bilious fevers in our cities, why do they not produce them in Lisbon, and in several other of the filthiest cities in the south of Europe? To this I answer, that filth and dirt are two distinct things. The streets of a city may be very *dirty*, that is covered with mud composed of inoffensive clay, sand, or lime, and, at the same time, be perfectly free from those *filthy* vegetable and animal matters which by putrefaction, contaminate the air. But admitting the streets of those cities to abound with the filthy matters that produce pestilential diseases in other countries, it is possible the exhalations from them may be so *constant*, and so *powerful*, in their impressions upon the bodies of the inhabitants, as to produce, from habit, no morbid effects, or but feeble diseases, as was remarked formerly, is the case in the natives and old settlers in the East and West-Indies. But if this explanation be not satisfactory, it may be resolved into a partial absence of an inflammatory constitution of the air, which, I shall say presently, must concur in producing pestilential diseases. Such deviations from uniformity in the works of Nature are universal. In the present instances, they no more invalidate the general proposition of malignant fevers being every where of domestic origin, than the exemption of Ireland from venomous reptiles, proves they are not generated in other countries, or that the pleurisy and rheumatism are not the effects of the alternate action of cold and heat upon the body, because hundreds, who have been exposed to them under equal circumstances, have not been affected by those diseases. There may be other parts of the world in which putrid matters do not produce bilious malignant diseases from the causes that have been mentioned, or from some

unknown cause, but I am safe in repeating, there never was a bilious epidemic yellow fever that could not be traced to putrid exhalation.

It has been asked, if the yellow fever be not imported, why does it make its first appearance among sailors, and near the docks and wharves of our cities? I answer, this is far from being true. The disease has as often appeared first at a distance from the shores of our cities as near them, but, from its connection with a ship not being discovered, it has been called by another name. But where the first cases of it occur in sailors, I believe the seeds of it are always previously received by them from our filthy docks and wharves, or from the foul air which is discharged with the cargoes of the ships in which they have arrived, which seeds are readily excited in them by hard labour, or intemperance so as to produce the disease. That this is the case, is further evident from its appearing in them, only in those months in which the bilious fever prevails in our cities.

It has been asked further, why were not these bilious malignant fevers more common before the years 1791, 1792, and 1793? To this I answer, by repeating what was mentioned in another place*, that our climate has been gradually undergoing a change. The summers are more alternated by hot and cool, and wet and dry weather, than in former years. The winters are likewise less uniformly cold. Grass is two or three weeks later in the spring in affording pasture to cattle than it was within the memory of many thousand people. Above all, the summer has encroached upon the autumn, and hence the frequent accounts we read in our newspapers of trees blossoming, of full grown strawberries and raspberries being gathered, and of cherries and apples, of a considerable size, being seen in the months of October and November, in all the middle states. By means of this protraction of the heat of summer, more time is given for the generation of putrid exhalations, and possibly for their greater concentration and activity in producing malignant bilious diseases.

It has been asked again, why do not the putrid matters which produce the yellow fever in some years pro-

* Account of the Climate of Pennsylvania, vol. i.

duce it *every* year? This question might be answered by asking two others. 1st. Why, if the yellow fever be derived from the West-Indies, was it not imported every year before 1791, and before the existence, or during the feeble and partial operation of quarantine laws? It is no answer to this question to say, that a war is necessary to generate the disease in the islands, for it exists in some of them at all times, and the seasons of its prevalence in our cities have, in many instances, had no connection with war, nor with the presence of European armies in those and other sickly parts of the globe. During the seven years revolutionary war it was unknown as an epidemic in the United States, and yet sailors arrived in all our cities daily from sickly islands, in small and crowded vessels, and sometimes covered with the rags they had worn in the yellow fever, in British hospitals and jails. I ask, 2dly, why does the dysentery (which is certainly a domestic disease) rise up in our country, and spread sickness and death through whole families and villages, and disappear from the same places for fifteen or twenty years afterwards?

The want of uniformity in the exhalations of our country in producing those diseases depends upon their being combined with more or less heat or moisture; upon the surface of the earth being completely dry, or completely covered with water;* upon different currents of winds, or the total absence of wind; upon the disproportion of the temperature of the air in the day and night; upon the quantity of dew; upon the early or late appearance of warm or cold weather; and upon the predisposition of the body to disease, derived from the quality of the aliments of the season. A similar want of uniformity in the annual operations of our climate appears in the size and quality of grain, fruits, and vegetables of all kinds.

* In the Account of the Yellow Fever of 1793, the different and opposite effects of a dry and rainy season in producing bilious fevers are mentioned from Dr. Dazilles. In the autumn of 1804, I have elsewhere remarked, after a summer in which there had fallen an unusual quantity of rain, the bilious fevers appeared chiefly on the high grounds in Pennsylvania, which were in a state of moisture, while scarcely a case of them appeared in the neighbourhood of marshes, or low grounds, owing to their being so completely covered with water, as to be incapable of generating, by putrefaction, the miasmata which produce those forms of disease.

But the greater violence and mortality of our bilious fevers, than in former years, must be sought for chiefly in an inflammatory or malignant constitution of the atmosphere, the effects of which have been no less obvious upon the small-pox, measles, and the intercurrent fevers of Dr. Sydenham, than they are upon the summer and autumnal disease that has been mentioned.

This malignant state of the air has been noticed, under different names, by all the writers upon epidemics, from Hippocrates down to the present day. It was ascribed, by the venerable father of physic, to a "divine something" in the atmosphere. Dr. Sydenham, whose works abound with references to it, supposes it to be derived from a mineral exhalation from the bowels of the earth. From numerous other testimonies of a belief in the influence of the insensible qualities of the air, altering the character of epidemics, I shall select the following:

"It is certain (says Dr. Moseley) that diseases undergo changes and revolutions. Some continue for a succession of years, and vanish when they have exhausted the temporary, but secret cause which produced them. Others have appeared and disappeared suddenly; and others have their periodical returns."

The doctor ascribes a malignant fever among the dogs in Jamaica (improperly called, from one of its symptoms, hydrophobia,) to a change in the atmosphere, in the year 1783. It was said to have been imported, but experience, he says, proved the fact to be otherwise.*

"This latent malignity in the atmosphere (says Baron Vansweiten) is known only by its effects, and cannot easily be reduced to any known species of acrimony." In another place he says, "It seems certain that this unknown matter disposes all the humours to a sudden and bad putrefaction."†

Dr. John Stedham has related many facts, in his Essay upon Insalutary Constitutions of the Air, which prove, that diseases are influenced by a quality in it, which, he says, "is productive of corruption," but which has hitherto eluded the researches of physicians."‡

* Treatise upon Tropical Diseases, p. 43, 44.

† Commentaries on Boerhaave's Aphorisms, vol. v. p. 226, 230.

‡ Page 135.

Mr. Lempriere, after mentioning the unusual mortality occasioned by the yellow fever, within the last five or six years, in the island of Jamaica, ascribes it wholly "to that particular constitution of atmosphere upon which the existence of epidemics, at one period rather than another, depend."*

Not only diseases bear testimony to a change in the atmosphere, but the whole vegetable and animal creation concur in it, proofs of which were mentioned in another place. Three things are remarkable with respect to this inflammatory constitution of the air.

1. It is sometimes of a local nature, and influences the diseases of a city, or country, while adjoining cities and countries are exempted from it.

2. It much oftener pervades a great extent of country. This was evident in the years 1793 and 1794, in the United States. During the same years, the yellow fever prevailed in most of the West-India islands. Many of the epidemics mentioned by Dr. Sims, in the first volume of the Medical Memoirs, affected, in the same years, the most remote parts of the continent of Europe. Even the ocean partakes of a morbid constitution of its atmosphere, and diseases at sea sympathise in violence with those of the land, at an immense distance from each other. This appears in a letter from a surgeon, on board a British ship of war, to Mr. Gooch, published in the third volume of his Medical and Surgical Observations.

3. The predisposing state of the atmosphere to induce malignant diseases continues for several years, under all the circumstances of wet and dry, and of hot and cold weather. This will appear, from attending to the accounts which have been given of the weather, in all the years in which the yellow fever has prevailed in Philadelphia since 1792.† The remark is confirmed by all the records of malignant epidemics.

It is to no purpose to say, the presence of the peculiar matter which constitutes an inflammatory or malignant state of the air has not been detected by any chemical agents. The same thing has been justly said of the exhalations which produce the bilious intermitting, remit-

* Vol. ii. p. 31.

† Vol. iii. and iv.

ting, and yellow fever. No experiment that has yet been made, has discovered their presence in the air. The eudiometer has been used in vain for this purpose. In one experiment made by Dr. Gattani, the air from a marsh at the mouth of the river Tataline was found to be apparently purer by two degrees than the air on a neighbouring mountain, which was 2880 feet higher than the sea. The inhabitants of the mountain were notwithstanding healthy, while those who lived in the neighbourhood of the marsh was annually afflicted with bilious and intermitting fevers.* The contagions of the small-pox and measles consist of matter, and yet who has ever discovered this matter in the air? We infer the existence of those remote causes of disease in the atmosphere only from their effects. Of the existence of putrid exhalations in it, there are other evidences besides bilious and yellow fevers. They are sometimes the objects of the sense of smelling. We see them in the pale or sallow complexions of the inhabitants of the countries which generate them, and we observe them occasionally in the diseases of several domestic animals. The most frequent of these diseases are inflammation, tubercles, and ulcers in the liver. Dr. Cleghorn describes a diseased state of that viscus in cattle, in an unhealthy part of the island of Minorca. Dr. Grainger takes notice of several morbid appearances in the livers of domestic animals in Holland, in the year 1743. But the United States have furnished facts to illustrate the truth of this remark. Mr. James Wardrobe, near Richmond in Virginia, informed me, that in August, 1794, at a time when bilious fevers were prevalent in his neighbourhood, his cattle were seized with a disease, which, I said formerly, is known by the name of the yellow water, and which appears to be a true yellow fever. They were attacked with a staggering. Their eyes were muddy, or ferocious. A costiveness attended in all cases. It killed in two days. Fifty-two of his cattle perished by it. Upon opening the bodies of several of them, he found the liver swelled and ulcerated. The blood was dissolved in the veins. In the bladder of

* Alibert's Dissertation sur les Fievres Pernicieuses et Attaxques Intermitentes, p. 185.

one of them, he found thirteen pints of blood and water. Similiar appearances were observed in the livers of sheep in the neighbourhood of Cadiz, in the year 1799, during the prevalence of the yellow fever in that city. They were considered as such unequivocal marks of an unwholesome atmosphere among the ancients, that they examined the livers of domestic animals, in order to determine on the healthy or unhealthy situation of the spot on which they wished to live.

The advocates for the yellow fever being a specific disease, and propagated only by contagion, will gain nothing by denying an inflammatory constitution of the atmosphere (the cause of which is unknown to us) to be necessary to raise common remittents to that grade in which they become malignant yellow fevers; for they are obliged to have recourse to an unknown quality in the air, every time they are called upon to account for the disease prevailing chiefly in our cities, and not spreading when it is carried from them into the country. The same reference to an occult quality in the air is had by all the writers upon the plague, in accounting for its immediate and total extinction, when it is carried into a foreign port.

In speaking of the influence of an inflammatory constitution of the atmosphere in raising common bilious, to malignant yellow fevers, I wish not to have it supposed, that its concurrence is necessary to produce sporadic cases of that, or any other malignant disease. Strong exciting causes, combined with highly volatilised and active miasmata, I believe, will produce a yellow fever at any time. I have seen one or more such cases almost every year since I settled in Philadelphia, and particularly when my business was confined chiefly to that class of people who live near the wharfs, and in the suburbs, and who are still the first, and frequently the only victims of the yellow fever.

It has been said, exultingly, that the opinion of the importation of the yellow fever is of great antiquity in our country, and that it has lately been admitted by the most respectable physicians in Britain and France, and sanctioned by the laws of several of the governments in Europe. And antiquity, numbers, rank, and power been just ar-

guments in favour of existing opinions, a thousand truths would have perished in their birth, which have diffused light and happiness over every part of our globe. In favour of the ancient and general belief of the importation of the yellow fever, there are several obvious reasons. The idea is produced by a single act of the mind. It requires neither comparison nor reasoning to adopt it, and therefore accords with the natural indolence of man. It, moreover, flatters his avarice and pride, by throwing the origin of a mortal disease from his property and country. The principle of thus referring the origin of the evils of life from ourselves to others, is universal. It began in paradise, and has ever since been an essential feature in the character of our species. It has constantly led individuals and nations to consider loathsome and dangerous diseases as of foreign extraction. The venereal disease and the leprosy have no native country, if we believe all the authors who have written upon them. Prosper Alpinus derives the plagues of Cairo from Syria, and the physicians of Alexandria import them from Smyrna or Constantinople. The yellow fever is said to have been first brought from Siam (where there are proofs it never existed) to the West-Indies, whence it is believed to be imported into the cities of the United States. From them, Frenchmen and Spaniards say it has been re-shipped, directly or indirectly, to St. Domingo, Havannah, Malaga, Cadiz, and other parts of the world. Weak and absurd credulity! the causes of the ferocious and mortal disease which we thus thrust from our respective ports, like the sin of Cain, "lie exclusively at our own doors."

Lastly, it has been asserted, if we admit the yellow fever to be an indigenous disease of our cities, we shall destroy their commerce, and the value of property in them, by disseminating a belief, that the cause of our disease is fixed in our climate, and that it is out of the power of human means to remove it. The reverse of this supposition is true. If it be an imported disease, our case is without a remedy; for if, with all the advantages of quarantine laws enforced by severe penalties, and executed in the most despotic manner, the disease has existed annually, in most of our cities, as an epidemic, or in sporadic

cases ever since the year 1791, it will be in vain to expect, from similar measures, a future exemption from it. Nothing but a belief in its domestic origin, and the adoption of means founded upon that belief, can restore the character of our climate, and save our commercial cities from destruction. Those means are cheap, practicable, and certain. They have succeeded, as I shall say presently, in other countries.

From the account that has been given of the different ways in which this disease is communicated from one person to another, and from the facts which establish its propagation exclusively through the medium of the atmosphere, when it becomes epidemic, we may explain several things which belong to its history, that are inexplicable upon the principle of its specific contagion.

1. We learn the reason why, in some instances, the fever does not spread from a person who sickens or dies at sea, who had carried the seeds of it in his body from a sickly shore. It is because no febrile miasmata exists in the bodies of the rest of the crew to be excited into action by any peculiar smell from the disease, or by fear or fatigue, and because no morbid excretions are generated by the person who dies. The fever which prevailed on board the Nottingham East-Indiaman, in the year 1766, affected those forty men only, who had slept on shore on the Island of Joanna twenty days before. Had the whole crew been on shore, the disease would probably have affected them all and been ascribed to contagion generated by the first persons who were confined by it.* A Danish ship, in the year 1768, sent twelve of her crew on shore for water. They were all seized after their return to the ship with a malignant fever, and died without infecting any person on board, and from the same causes which preserved the crew of the Nottingham East-Indiaman.†

2. We learn the reason why the disease sometimes spreads through a whole ship's crew apparently from one, or more affected persons. It is either because they have

* Observations on the Bilious Fevers usual in voyages to the East-Indies, by James Bidenach, M. D. Medical Observations and Inquiries, vol. iv.

† Clarke on the Diseases of Long Voyages to Hot Climates, p. 123, 125.

been confined to small and close births by bad weather, or because the fever has been protracted to a typhus or chronic state, or because the bodies of the whole crew are impregnated with morbid miasmata, and thus predisposed to have the disease excited in the manner that has been mentioned. In the last way it was excited in most of the crew of the United States frigate, in the Delaware, opposite to the city of Philadelphia, in the year 1797. It appears to have spread, from a similar cause, from a few sailors, on board the Grenville Indiaman, after touching at Batavia. The whole crew had been predisposed to the disease by inhaling the noxious air of that island.

The same reasons account for the fever expiring in a healthy village or country; also for its spreading when carried to those towns which are seated upon creeks or rivers, and in the neighbourhood of marsh exhalations: It has uniformly perished in the high and healthy village of Germantown, when carried from Philadelphia, and has three times been supposed, erroneously, to be contagious near the muddy shores of the creeks which flow through Wilmington and Chester.

3. From the facts that have been mentioned, we are taught to disbelieve the possibility of the disease being imported in the masts and sails of a ship, by a contagious matter secreted by a sailor who may have sickened or died on board her, on a passage from a West-India island. The death in most of the cases supposed to be imported, in this way, occurs within a few days after the ship leaves her West-India port, or within a few days after her arrival. In the former case, the disease is derived from West-India miasmata; in the latter, it is derived, as was before remarked, either from the foul air of the hold of the ship, or of the dock or wharf to which the ship is moored.

Many other facts might be adduced to show the yellow fever not to be an imported disease. It has often prevailed among the Indians remote from the sea coast, and many hundred cases of it have occurred since the year 1793, on the inland waters of the United States, from the Hudson and Susquehannah, to the rivers of the

Mississippi. In South America, Baron Humboldt assured me, it is every where believed to be an endemic of that country.

These simple and connected facts, in which all the physicians in the United States who derive the yellow fever from domestic causes have agreed, will receive fresh support by comparing them with the different and contrary opinions of the physicians who maintain its importation. Some of them have asserted it to be a specific disease, and derived it from the East and West-Indies; others derive it from Beulam, on the coast of Africa; a third sect have called it a ship fever; a fourth have abscribed it to a mixture of imported contagion with the foul air of our cities; while a fifth, who believe it to be imported in 1793, have supposed it to be the offspring of a contagion left by the disease of that year, revived by the heat of our summers, and disseminated, ever since, through the different cities of our country. The number of these opinions, clearly proves, that no one of them is tenable.

A belief in the non-contagiousness of the yellow fever, or of its being incommunicable except in one of the five ways that have been mentioned, is calculated to produce the following good effects :

1. It will deliver the states which have sea-ports from four-fifths of the expenses of their present quarantine laws and lazarettoes. A very small apparatus, in laws and officers, would be sufficient to prevent the landing of persons affected by the ship fever in our cities, and the more dangerous practice of ships pouring streams of pestilential air, from their holds, upon the citizens who live near the docks and wharves.

2. It will deliver our merchants from the losses incurred by the delays of their ships, by long and unnecessary quarantines. It will, moreover, tend to procure the immediate admission of our ships into foreign ports, by removing that belief in the contagious nature of the yellow fever, which originated in our country, and which has been spread, by the public acts of our legislatures and boards of health, throughout the globe.

3. It will deliver our citizens from the danger to which they are exposed, by spending the time of the quarantine, on board of vessels in the neighbourhood of the marshes which form the shores of the rivers or coasts of quarantine roads. This danger is much increased by idleness, and by the vexation which is excited, by sailors and passengers being detained, unnecessarily, fifteen or twenty days from their business and friends.

4. It will lead us to a speedy removal of all the excretions, and a constant ventilation of the rooms of patients in the yellow fever, and thereby to prevent the accumulation, and further putrefaction of those exhalations which may produce it.

5. It is calculated to prevent the desertion of patients in the yellow fever, by their friends and families, and to produce caution in them to prevent the excitement of the disease in their own bodies, by means of low diet and gentle physic, proportioned to the impurity of the air, and to the anxiety and fatigue to which they are exposed in attending the sick.

6. It will put an end to the cruel practice of quieting the groundless fears of a whole neighbourhood, by removing the poor who are affected by the fever, from their houses, and conveying them, half dead with disease and terror, to a solitary or crowded hospital, or of nailing a yellow flag upon the doors of others, or of fixing a guard before them, all which have been practised in Philadelphia, not only without any good effect, but to the great injury of the sick.

7. By deriving the fever from our own climate and atmosphere, we shall be able to foresee its approach in the increased violence of common diseases, in the morbid state of vegetation, in the course of the winds, in the diseases of certain brute animals, and in the increase of common, or the appearance of uncommon insects.

8. A belief in the non-contagiousness of the yellow fever, and its general prevalence from putrid animal and vegetable matters *only*, is calculated to lead us to drain or cover marshy grounds, and to remove from our cities all the sources of impure air, whether they exist in the

holds of ships, in docks, gutters, and common sewers, or in privies, gardens, yards, and cellars, more especially during the existence of the signs of a malignant constitution of the air. A fever, the same in its causes, and similar to it in many of its symptoms, that is, the plague, has been extirpated, by extraordinary degrees of cleanliness, from the cities of Holland, Great-Britain, and several other parts of Europe.

The reader will perceive, from these facts and reasonings, that I have relinquished the opinion published in my account of the yellow fever in the years 1793, 1794, and 1797, respecting its contagious nature. I was misled by Dr. Lining, and several West-India writers, in ascribing a much greater extent to the excreted matters in producing the disease, than I have since discovered to be correct, and by Bianchi, Lind, Clark, and Cleghorn, in admitting even the common bilious fever to be contagious. The reader will perceive, likewise, that I have changed my opinion respecting one of the modes in which the plague is propagated. I once believed, upon the authorities of travellers, physicians and schools of medicine, that it was a highly contagious disease. I am now convinced this is not the case; but, from the greater number of people who were depressed and debilitated by poverty and famine, and who live in small and filthy huts* in the cities of the east, than in the cities or the United States. I still believe it to be more frequently communicated from an intercourse with sick people by the morbid excretions of the body, than the yellow fever is in our country. For the change of my opinion upon this subject, I am indebted to Dr. Caldwell's and Mr. Webster's publications upon pestilential diseases, and to the travels of Mariti Sonnini into Syria, and Egypt. I reject, of course, with the contagious quality of the plague, the idea of its ever being imported into any country so as to become epidemic, by means of a knife-case, a piece of cotton, or a bale of silks, with the same decision that I do all the improbable and contradictory reports of an epidemic yellow fever being imported in a sailor's

* M. Savary, in his Travels, says, two hundred persons live in Cairo within a compass that accommodate but thirty persons in Paris.

jacket, or in the timbers and sails of a ship that had been washed by the salt water, and fanned by the pure air of the ocean, for several weeks, on her passage from the West-Indies to the United States.

In a former inquiry,* I have taken notice of the metastasis of error from one medical subject to another. It is to be lamented that a similar translation of error has taken place from religion to medicine. In the close of the 10th century, Pope Gregory excommunicated Robert, king of France, for marrying his fourth cousin. The king disregarded the edict of the pope, and continued to live with his queen. In consequence of his doing so, all his courtiers and even his domestics deserted him, two of the latter only excepted. But such was the dread of these two faithful servants, lest they should be infected with the sin of their royal master, that they threw all the remains of his meals to the dogs, and even purified the vessels in which they had been prepared. Let the reader of this fact, whoever he may be, pause and reflect, that if he has at any time deserted the sick chamber of a relation, a friend, or a neighbour in the plague, or yellow fever, if he has destroyed the bedding or clothes of a person who has had either of those diseases, or if he has approved of a law, which has imposed upon a fellow citizen, returning in health from a West-India voyage, an offensive fumigation, or a tedious quarantine at a sickly lazaretto, in order to destroy their supposed contagiousness, let him be assured, whatever his talents and acquirements may be, the folly of the domestics of the king of France cleaves to him in another form, and will inevitably consign his character with theirs, to the pity and ridicule of future generations.

It gives me pleasure to find the unpopular opinion of the non-contagiousness of the plague, which I have adopted, is not a new one. It was held by the Faculty of Medicine in Paris, in the beginning of the eighteenth century, and was ably defended by Dr. Pringle and Dr. Pye, about the year 1720, in two very sensible pamphlets, which are to be seen in the library of the Pennsylvania hospital, written in opposition to Dr. Mead's learned and popular tract upon that subject, and which at once terrified and misled all the nations of Europe. The same opinion

* Upon the Gout.

of the non-contagiousness of the plague has since been maintained by Dr. Stoll of Vienna, and Dr. Samoilowitz of Russia, and several other eminent physicians. Dr. Heberden has lately called in question the truth of all the stories that are upon record of the plague having been imported into England in the last century, and the researches of Sir Robert Wilson of the British army, and of Assellini, and several other French physicians, have produced the most satisfactory proofs of its not being a contagious disease in its native country. A discovery more pregnant with blessings to mankind has seldom been made. Pyramids of error, the works of successive ages and nations, must fall before it, and rivers of tears must be dried up by it. It is impossible fully to appreciate the immense benefits which await this mighty achievement of our science upon the affairs of the globe. Large cities shall no longer be the hot-beds of disease and death. Marshy grounds, teeming with pestilential exhalations, shall become the healthy abodes of men. A powerful source of repulsion between nations shall be removed, and commerce shall shake off the fetters which have been imposed upon it by expensive and vexatious quarantines. A red or a yellow eye shall no longer be the signal to desert a friend or a brother to perish alone in a garret or a barn, nor to expel the stranger from our houses, to seek an asylum in a public hospital, to avoid dying in the street. The number of diseases shall be lessened, and the most mortal of them shall be struck out of the list of human evils. To accelerate these events, it is incumbent upon the physicians of the United States to second the discoveries of their European brethren. It becomes them constantly to recollect, that we are the centinels of the health and lives of our fellow-citizens, and that there is a grade of benevolence in our profession much higher than that which arises from the cure of diseases. It consists in exterminating their causes.

A DEFENCE
OF
BLOOD-LETTING,
AS A
REMEDY FOR CERTAIN DISEASES.

A DEFENCE, &c.

BLOOD-LETTING, as a remedy for fever, and certain other diseases, having lately been the subject of much discussion, and many objections having been made to it which appear to be founded in error and fear, I have considered that a defence of it, by removing those objections, might render it more generally useful, in every part of the United States.

I shall begin this subject by remarking, that blood-letting is indicated, in fevers of great morbid excitement.

1. By the sudden suppression or diminution of the natural discharges by the pores, bowels, and kidneys, whereby a plethora is induced in the system.

2. By the habits of the persons who are most subject to such fevers.

3. By the phenomena of fever. I have attempted to prove that the higher grades of fever depend upon morbid and excessive action in the blood-vessels. It is connected of course, with preternatural sensibility in their muscular fibres. The blood is the most powerful irritant which acts upon them. By abstracting a part of it, we lessen the principal cause of the fever. The effect of blood-letting is as immediate and natural in removing fever, as the abstraction of a particle of sand is, to cure an inflammation of the eye, when it arises from that cause.

4. By the symptoms of the first stage of violent fevers, such as a sleepiness and an oppressed pulse, or by delirium, with a throbbing pulse, and great pains in every part of the body.

5. By the rupture of the blood-vessels, which takes place from the quantity or impetus of the blood in fevers of great morbid action. Let no one call bleeding a cruel or unnatural remedy. It is one of the specifics of nature; but in the use of it she seldom affords much relief. She

frequently pours the stimulating and oppressing mass of blood into the lungs and brain; and when she finds an outlet for it through the nose, it is discharged either in such a deficient or excessive quantity, as to be useless or hurtful. By artificial blood-letting, we can chuse the *time* and *place* of drawing blood, and we may regulate its quantity by the degrees of action in the blood-vessels. The disposition of nature to cure violent morbid action by depletion, is further manifested by her substituting, in the room of blood-letting, large, but less safe and less beneficial, evacuations from the stomach and bowels.

6. By the structure and use of the *spleen*. I have called it in my lectures upon physiology, a bason furnished by nature to hold redundant blood, or to afford it a temporary asylum, when the blood-vessels are unduly excited. Now the spleen is sometimes too small, and often so overcharged with blood, or so obstructed, that it cannot perform this office, in which case blood-letting is indicated. The great enlargement and engorgement of the spleen in fatal cases of bilious fevers where sufficient bleeding has not been used, prove the truth of this remark. The relief which bleeding gives in chronic and winter intermittents, is probably occasioned by the spleen being so much obstructed, as not to receive the blood in a paroxysm of fever. The lancet here performs its vicarious office.

7. By the relief which is obtained in fevers of violent action by remedies of less efficacy (to be mentioned hereafter), which act indirectly in reducing the force of the sanguiferous system.

I. By the immense advantages which have attended the use of blood-letting in violent fevers, when used at a proper time, and in a quantity suited to the force of the disease. I shall briefly enumerate these advantages.

1. It frequently strangles a fever, when used in its forming state, and thereby saves much pain, time, and expense to a patient.

2. It imparts strength to the body, by removing the depression which is induced by the remote cause of the fever. It removes a disposition to faint, which arises from this state of the system.

3. It reduces the uncommon frequency of the pulse.

The loss of ten ounces of blood reduced Miss Sally Eyre's pulse from 175 strokes to 140, in a few minutes, in the fever of the year 1794. Dr. Gordon mentions many similar instances of its reducing the frequency of the pulse, in the puerperile fever.

4. It renders the pulse more frequent when it is preternaturally slow.

5. It checks the nausea and vomiting, which attend the malignant state of fever. Of this I saw many instances in the year 1794. Dr. Poissonnier Desperrieres confirms this remark, in his Account of the Fevers of St. Domingo; and adds further, that it prevents, when sufficiently copious, the troublesome vomiting which often occurs on the fifth day of the yellow fever.* It has the same effect in preventing the diarrhœa in the measles.

6. It renders the bowels, when costive, more easily moved by purging physic.

7. It renders the action of mercury more speedy and more certain, in exciting a salivation.

8. It disposes the body to sweat spontaneously, or renders diluting and diaphoretic medicines more effectual for that purpose.

9. It *suddenly* removes a dryness, and *gradually* a blackness, from the tongue. Of the former effect of bleeding, I saw two instances, and of the latter, one, during the autumn of 1794.

10. It removes or lessens pain in every part of the body, and more especially the head

11. It removes or lessens the burning heat of the skin, and the burning heat in the stomach, so common and so distressing in yellow fever.

12. It removes a constant chiliness, which sometimes continues for several days, and which will neither yield to cordial drinks, nor warm bed clothes.

13. It checks such sweats as are profuse without affording relief, and renders such as are partial and moderate, universal and salutary.

14. It sometimes checks a diarrhœa and tenesmus, after astringent medicines have been given to no purpose. This has often been observed in the measles.

* Traité des Fievres de l'Isle de St. Dominique, vol. ii. p. 76.

15. It suddenly cures the intolerance of light which accompanies many of the inflammatory states of fever.

16. It removes coma. Mr. Henry Clymer was suddenly relieved of this alarming symptom, in the fever of 1794, by the loss of twelve ounces of blood.

17. It induces sleep. This effect of bleeding is so uniform, that it obtained, in the year 1794, the name of an anodyne in several families. Sleep sometimes stole upon the patient while the blood was flowing.

18. It prevents effusions of serum and blood. Hæmorrhages seldom occur, where bleeding has been sufficiently copious.

19. It belongs to this remedy to prevent the chronic diseases of cough, consumption, jaundice, abscess in the liver, and all the different states of dropsy which so often follow autumnal fevers.

My amiable friend, Mrs. Lennox, furnished an exception to this remark, in the year 1794. After having been cured of the yellow fever by seven bleedings, she was affected, in consequence of taking a ride, with a slight return of fever, accompanied by an acute pain in the head, and some of the symptoms of a dropsy of the brain. As her pulse was tense and quick, I advised repeated bleedings to remove it. This prescription, for reasons which it is unnecessary to relate, was not followed at the time, or in the manner, in which it was recommended. The pain, in the mean time, became more alarming. In this situation, two physicians were proposed by her friends to consult with me. I objected to them both, because I knew their principles and modes of practice to be contrary to mine, and that they were proposed only with a view of wresting the lancet from my hand. From this desire of avoiding a controversy with my brethren, where conviction was impossible on either side, as well as to obviate all cause of complaint by my patient's friends, I offered to take my leave of her, and to resign her wholly to the care of the two gentlemen who were proposed to attend her with me. To this she objected in a decided manner. But that I might not be suspected of an undue reliance upon my own judgment, I proposed to call upon Dr. Griffiths or Dr. Physick to assist me in my attendance upon

her. Both these physicians had renounced the prejudices of the schools in which they had been educated, and had conformed their principles and practice to the present improving state of medical science. My patient preferred Dr. Griffiths, who, in his first visit to her, as soon as he felt her pulse, proposed more bleeding. The operation was performed by the doctor himself, and repeated daily for five days afterwards. From an apprehension that the disease was so fixed as to require some aid to blood-letting, we gave her calomel in such large doses as to excite a salivation. By the use of these remedies she recovered slowly, but so perfectly as to enjoy her usual health.

20. Bleeding prevents the termination of malignant, in the gangrenous state of fever. This effect of blood-letting will enable us to understand some things in the writings of Dr. Morton and Dr. Sydenham, which at first sight appear to be unintelligible. Dr. Morton describes what he calls a putrid fever, which was epidemic and fatal, in the year 1678. Dr. Sydenham, who practised in London at the same time, takes no notice of this fever. The reason of his silence is obvious. By copious bleeding, he prevented the fever of that year from running on to the gangrenous state, while Dr. Morton, by neglecting to bleed, created the supposed putrid fevers which he has described.

It has been common to charge the friends of blood-letting with *temerity* in their practice. From this view which has been given of it, it appears, that it would be more proper to ascribe *timidity* to them, for they bleed to prevent the offensive and distressing consequences of neglecting it, which have been mentioned.

21. It cures, without permitting a fever to put on those alarming symptoms, which excite constant apprehensions of danger and death, in the minds of patients and their friends. It is because these alarming symptoms are prevented, by bleeding, that patients are sometimes unwilling to believe they had been cured by it, of a malignant fever. Thus, the Syrian leper of old, viewed the water of Jordan as too simple and too common to cure a formidable disease, without recollecting that the remedies for the greatest

evils of life are all simple, and within the power of the greatest part of mankind.

22. It prepares the way for the successful use of the bark and other tonic remedies, by destroying, or so far weakening, a morbid action in the blood-vessels, that a medicine of a moderate stimulus afterwards exceeds it in force, and thereby restores equable and healthy action to the system.

23. Bleeding prevents relapses. It, moreover, prevents that predisposition to the intermitting and pleuritic states of fever, which so frequently attack persons in the spring, who have had the bilious remitting fever in the preceding autumn.

But great and numerous as the advantages of blood-letting are in fevers, there have been many objections to it. I shall briefly enumerate, and endeavour to refute the errors upon this subject.

Blood-letting has been forbidden by physicians, by the following circumstances, and states of the system.

1. By warm weather. Galen bled in a plague, and Aræteus in a bilious fever, in a warm climate. Dr. Sydenham and Dr. Hillary inform us, that the most inflammatory fevers occur in, and succeed hot weather. Dr. Cleghorn prescribed it copiously in the warm months, in Minorca. Dr. Mosely cured the yellow fever by this remedy, in Jamaica. Dr. Broadbelt, and Dr. Weston in the same island, have lately adopted his successful practice. Dr. Desportes speaks in the highest terms of it in all the inflammatory diseases of St. Domingo. He complains of the neglect of it in the rheumatism, in consequence of which, he says, the disease produces abscesses in the lungs. Dr. Pugnoet says the native physicians of upper Egypt bleed in all violent diseases. They are governed in their practice by the state of the pulse in the temples, and when it does not afford the indication sought for, they regulate the use of the lancet by the greater or less red colour of the body. I have never, in any year of my practice, been restrained by the heat of summer in the use of the lancet, where the pulse has indicated it to be necessary, and have always found the same advantages from it, as when I have prescribed it in the winter or spring months.

In thus deciding in favour of bleeding in warm weather, I do not mean to defend its use to the same extent, as to diseases, or to quantity, in the native and long settled inhabitants of hot climates, as in persons who have recently migrated to them, or who live in climates alternately hot and cold.

2. Being born, and having lived in a warm climate. This is so far from being an objection to blood-letting in an inflammatory disease, that it renders it more necessary. I think I have lost several West-India patients from the influence of this error.

3. Great apparent weakness. This, in acute and violent fevers, is always from a depressed state of the system. It resembles, in so many particulars, that weakness which is the effect of the abstraction of stimulus, that it is no wonder they have been confounded by physicians. This sameness of symptoms from opposite states of the system is taken notice of by Hippocrates. He describes convulsions, and particularly a hiccup, as occurring equally from repletion and inanition, which answer to the terms of depression, and debility from action and abstraction. The natural remedy for the former is depletion, and no mode of depleting is so effectual or safe as blood-letting. But the great objection to this remedy is, when a fever of great morbid excitement affects persons of delicate constitutions, and such as have long been subject to debility of the chronic kind. In this state of the system, there is the same morbid and preternatural action in the blood-vessels, that there is in persons of robust habits, and the same remedy is necessary to subdue it in both cases. It is sometimes indicated in a larger quantity in weakly than in robust people, by the plethora which is more easily induced in their relaxed and yielding blood-vessels, and by the greater facility with which ruptures and effusions take place in their viscera. Thus it is more necessary to throw overboard a large part of the cargo of an old and leaky vessel in a storm, than of a new and strong one. I know that vomits, purges, sweats, and other evacuating remedies, are preferred to bleeding in weakly constitutions, but I hope to show hereafter, that bleeding is not only more effectual, but more safe in such habits, than any other depleting remedy.

4. Infancy and childhood. Bleeding is so far from being forbidden by these stages of life, that it is called for in a greater degree under equal circumstances, than in the diseases of adults, by the peculiar excitability of the blood-vessels in children, by the difficulty of reducing their systems by means of sweats, and in diseases of the lungs and trachea, by their inability under two years old, to remove the irritation excited by phlegm and mucus in those organs, by expectoration. Dr. Sydenham bled children in the whooping cough, and in dentition. I bled my eldest daughter when she was but six weeks old, for convulsions brought on by an excessive dose of laudanum given to her by her nurse; and I bled one of my sons twice, before he was two months old, for an acute fever which fell upon his lungs and bowels. In both cases, life appeared to be saved by this remedy. I could mention many more instances in which it has snatched from the grave, children under three and four months old, by being used from three to five times in the ordinary course of their acute diseases.

5. Old age. The increase of appetite in old people, their inability to use sufficient exercise, whereby their blood-vessels become relaxed, plethoric, and excitable, and above all, the translation of the strength of the muscles to arteries, and of plethora to the veins, all indicate bleeding to be more necessary (in equal circumstances) in old, than in middle aged people. My practice in the diseases of old people has long been regulated by the above facts. I bled Mrs. Fullerton twice in a pleurisy in January, 1804, in the 84th year of her age, and thereby cured her disease. I drew six and thirty ounces of blood, in the year 1806, at three bleedings, from Mr. Israel Jacobs in the 91st year of his age, in a bilious fever, in the course of a few days. He was cured by this remedy, and at this time, July 29th, 1809, enjoys good health. I am not the author of this bold practice. Botallus left a testimony in favour of it nearly 200 years ago,* and it has since been confirmed by the experience of Hoffman, and many other physicians. An ignorance of, or inattention to this change in the state

* *Magis esse adjuvandos senes, missione sanguinis dum morbus postulat, aut corpus eorum habitus malus est, quam ubi hæc (quod absonum videbitur) juvenibus contingunt.*

of the blood-vessels, in persons in the decline of life, and the neglect of the only remedy indicated by it, is probably the reason why diseases often prove fatal to them, which in early or middle life cured themselves, or yielded to a single dose of physic, or a few ounces of bark.

6. The time of menstruation. The uterus, during this period, is in an inflamed state, and the whole system is plethoric and excitable, and of course disposed to a violent degree of fever, from all the causes which excite it. Bleeding, therefore, is more indicated, in fever of great morbid action, at this time, than at any other. Formerly the natural discharge from the uterus was trusted to, to remove a fever contracted during the time of menstruation; but what relief can the discharge of four or five ounces of blood from the uterus afford, in a fever which requires the loss of 50, or perhaps 100 ounces to cure it?

7. Pregnancy. The inflammation and distention induced upon the uterus by pregnancy, and the inflammatory diathesis thereby imparted to the whole system, render bleeding, in the acute states of fever, more necessary than at other times. I have elsewhere mentioned the advantages of bleeding pregnant women, in the yellow fever. I did not learn the advantages of the practice in that disease. I bled Mrs. Philler 11 times in seven days, in a pleurisy during her pregnancy, in the month of March, 1783. Mrs. Fiss was bled 13 times in the spring of 1783; and Mrs. Kirby 16 times in the same condition, by my orders, in the winter of 1786, in a similar disease. All these women recovered, and the children they carried during their illness, are at this time alive, and in good health.

8. Fainting after bleeding. This symptom is accidental in many people. No inference can be drawn from it against blood-letting. It often occurs after the first and second bleedings in a fever, but in no subsequent bleeding, though it be repeated a dozen times. Of this I saw several instances, in the yellow fever of 1794. The pulse, during the fainting, is often tense and full.

9. Coldness of the extremities, and of the whole body. This cold state of fever when it occurs early, yields more readily to bleeding, than to the most cordial medicines.

10. Sweats are supposed to forbid blood-letting. I have seen two instances of death, from having a paroxysm

of malignant fever to terminate itself by sweating. Dr. Sydenham has taught a contrary practice in the following case. "While this constitution (says the doctor) prevailed, I was called to Dr. Morice, who then practised in London. He had this fever, attended with profuse sweats, and numerous petechiæ. By the consent of some other physicians, our joint friends, he was bled, and rose from his bed, his body being first wiped dry. He found immediate relief from the use of a cooling diet and medicines, the dangerous symptoms soon going off, and by continuing this method he recovered in a few days."* In the same fever, the doctor adds further, "For though one might expect great advantages in pursuing an indication taken from what generally proves serviceable (viz. sweating,) yet I have found, by constant experience, that the patient not only finds no relief, but, contrariwise, is more heated thereby; so that frequently a delirium, petechiæ, and other very dangerous symptoms immediately succeed such *sweats*."†

Morgagni describes a malignant fever which prevailed in Italy, in which the patients died in profuse sweats, while their physicians were looking for a crisis from them. Bleeding would probably have checked these sweats, and cured the fever.

11. Dissolved blood, and an absence of an inflammatory crust on its crassamentum. I shall hereafter place dissolved blood at the highest point of a scale, which is intended to mark the different degrees of morbid action in the system. I have mentioned, in the *Outlines of the Phenomena of Fever*, that it is the effect of a tendency to a palsy, induced by the violent force of impression upon the blood-vessels, rending and tearing the blood to pieces. This appearance of the blood in certain states of fever, instead of forbidding bleeding, is the most vehement call of the system for it. Nor is the absence of a crust on the crassamentum of the blood, a proof of the absence of great morbid diathesis, or a signal to lay aside the lancet. On the contrary, I shall show hereafter, that there are several appearances of the blood which indi-

* Wallis's edition, vol. i. p. 210.

† Vol. i. p. 208.

cate more morbid action in the blood-vessels than a sizzly or inflammatory crust.

12. An undue proportion of serum to crassamentum in the blood. The predominance of water in the blood has often checked sufficient blood-letting. But it should be constantly disregarded, while it is attended with those states of pulse (to be mentioned hereafter) which require bleeding.

13. The presence of petechiæ on the skin. These, I have elsewhere said, are the effects of the gangrenous state of fever. Dr. Sydenham and Dr. de Haen have taught the safety and advantage of bleeding, when these spots are accompanied by an active pulse. A boy of Mr. John Carrol owes his recovery from the small-pox to the loss of fifty ounces of blood, by five bleedings, at a time when nearly every pock on his arms and legs had a purple appearance. Louis XIV. was bled five times in the small-pox, when he was but thirteen years of age, and thereby probably saved from the grave, to the great honour and emolument of the single physician who urged it against the advice of all the other physicians of the court. Dr. Cleghorn mentions a single case of the success of bleeding in the petechial small-pox. His want of equal success afterwards, in similar cases, was probably occasioned by his bleeding too sparingly, that is, but three or four times.

Abscesses and sore breasts, which accompany or succeed fever, are no objections to blood-letting, provided the pulse indicate the continuance of inflammatory diathesis. They depend frequently upon the same state of the system as livid effusions on the skin.

14. The long duration of fever. Inflammatory diathesis is often protracted for many weeks, in the chronic state of fever. It, moreover, frequently revives after having disappeared, from an accidental irritant affecting some part of the body, particularly the lungs and brain. I bled a young man of James Cameron, in the autumn of 1794, four times between the 20th and 30th days of a chronic fever, in consequence of a pain in the side, accompanied by a tense pulse, which suddenly came on after the 20th day of his disease. His blood was sizzly.

His pain and tense pulse were subdued by the bleeding and he recovered. I bled the late Dr. Prowl twelve times, in a fever which continued thirty days, in the autumn of the year 1800. I wish these cases to be attended to by young practitioners. The pulmonary consumption is often the effect of a chronic fever, terminating with fresh inflammatory symptoms, by effusions in the lungs. It may easily be prevented by forgetting the number of the days of our patient's fever, and treating the pulmonary affection as if it were a recent complaint.

15. Tremors and slight convulsions in the limbs. Bark, wine, laudanum and musk are generally prescribed to remove these symptoms; but, to be effectual, they should, in most cases, be preceded by the loss of a few ounces of blood.

16. Bleeding is forbidden after the fifth or seventh day in a pleurisy. This prohibition was introduced into medicine at a time when a fear was entertained of arresting the progress of nature in preparing and expelling morbid matter from the system. From repeated experience I can assert, that bleeding is safe in every stage of pleurisy in which there is pain, and a tense and oppressed pulse; and that it has, when used for the first time after the fifth and seventh days, saved many lives. Bleeding has likewise been limited to a certain number of ounces in several states of fever. Were the force of the remote cause of a fever, its degrees of violence, and the habits of the subject of it, always the same, this rule would be a proper one; but, this not being the case, we must be governed wholly by the condition of the system, manifested chiefly by the state of the pulse. To admit of copious bleeding in one state of fever, and not in another, under equal circumstances of morbid excitement, is to prescribe for its name, and to forget the changes which climate, season, and previous habits create in all its different states.

17. The loss of a sufficient quantity of blood is often prevented by patients being apparently *worse*, after the first or second bleeding. This change for the worse, shows itself in some one or more of the following symptoms, viz. increase of heat, chills, delirium, hæmorrhages, con-

vulsions, nausea, vomiting, faintness, coma, great weakness, pain, a tense, after a soft pulse, and a reduction of it in force and frequency. They are all occasioned by the system rising suddenly from a state of extreme depression, in consequence of the abstraction of the pressure of the blood to a state of vigour and activity, so great, in some instances, as to reproduce a depression below what existed in the system before a vein was opened; or it is occasioned by a translation of morbid action from one part of the body to another.

The chills which follow bleeding are the effects of a change in the fever, from an uncommon to a common state of malignity. They occur chiefly in those violent cases of fever which come on without a chilly fit.

The hæmorrhages produced by bleeding are chiefly from the nose, hæmorrhoidal vessels, or uterus, and of course are, for the most part, safe.

Uncommon weakness, succeeding blood-letting, is the effect of sudden depression induced upon the whole system, by the cause before mentioned, or of a sudden translation of the excitement of the muscles into the blood-vessels, or some other part of the body. These symptoms, together with all others which have been mentioned, are so far from forbidding, that they almost forcibly indicate a repetition of blood-letting.

I shall briefly illustrate, by the recital of three cases, the good effects of bleeding, in removing pain, and the preternatural slowness and weakness of the pulse, when produced by the use of that remedy.

In the month of June of 1795, I visited Dr. Say in a malignant fever, attended with pleuritic symptoms, in consultation with Dr. Physick. An acute pain in his head followed six successive bleedings. After a seventh bleeding, he had no pain. His fever soon afterwards left him. In thus persevering in the use of a remedy, which, for several days, appeared to do harm, we were guided wholly by the state of his pulse, which uniformly indicated, by its force, the necessity of more bleeding.

In the autumn of 1794, I was sent for to visit Samuel Bradford, a young man of about 20 years of age, son of Mr. Thomas Bradford, who was ill with the reigning

malignant epidemic. His pulse was at 80. I drew about 12 ounces of blood from him. Immediately after his arm was tied up, his pulse fell to 60 strokes in a minute. I bled him a second time, but more plentifully than before, and thereby in a few minutes, brought his pulse back again to 80 strokes in a minute. A third bleeding the next day aided by the usual purging physic, cured him in a few days after.

In the month of March, 1795, Dr. Physick requested me to visit, with him, Mrs. Fries, the wife of Mr. John Fries, in a malignant fever. He had bled her four times. After her fourth bleeding, her pulse suddenly fell, so as scarcely to be perceptible. I found her hands and feet cold, and her countenance ghastly, as if she were in the last moments of life. In this alarming situation, I suggested nothing to Dr. Physick but to follow his judgment, for I knew that he was master of that law of the animal economy which resolved all her symptoms into an oppressed state of the system. The doctor decided in a moment in favour of more bleeding. During the flowing of the blood the pulse rose. At the end of three, ten, and seventeen hours it fell, and rose again by three successive bleedings, in all of which she lost about thirty ounces of *sizy* blood. So great was the vigour acquired by the pulse, a few days after the paroxysms of depression, which have been described, were relieved, that it required seven more bleedings to subdue it. I wish the history of these two cases to be carefully attended to by the reader. I have been thus minute in the detail of them, chiefly because I have heard of practitioners who have lost patients by attempting to raise a pulse that had been depressed by bleeding, in a malignant fever, by means of cordial medicines, instead of the repeated use of the lancet. The practice is strictly rational; for, in proportion as the blood-vessels are weakened by pressure, the quantity of blood to be moved should be proportioned to the diminution of their strength.

This depressed state of the pulse, whether induced by a paroxysm of fever, or by blood-letting, is sometimes attended with a strong pulsation of the arteries in the bowels and head.

I have mentioned, among the *apparent* bad effects of bleeding, that it sometimes changes a soft into a tense pulse. Of this I saw a remarkable instance in Captain John Barry, in the autumn of 1795. After the loss of 130 ounces of blood in a malignant yellow fever, his pulse became so soft as to indicate no more bleeding. In this situation he remained for three days, but without mending as rapidly as I expected from the state of his pulse. On the fourth day he had a hæmorrhage from his bowels, from which he lost above a pint of blood. His pulse now suddenly became tense, and continued so for two or three days. I ascribed this change in his pulse to the vessels of the bowels, which had been oppressed by congestion, being so much relieved by the hæmorrhages, as to resume an inflammatory action. I have observed a similar change to take place in the pulse, after a third bleeding, in a case of hæmorrhoidal fever, which came under my notice in the month of January, 1803. It is thus we see the blood-vessels, in a common phlegmon, travel back again, from a tendency to mortification, to the red colour and pain of common inflammation.

From a review of the commotions excited in the system by bleeding, a reason may be given why the physicians, who do not bleed in the depressed state of the pulse, have so few patients in what they call malignant fevers, compared with those who use a contrary practice. The disease, in such cases, being locked up, is not permitted to unfold its true character; and hence patients are said to die of apoplexy, lethargy, cholera, dysentery, or nervous fever, who, under a different treatment, would have exhibited all the marks of an ordinary malignant fever.

In obviating the objections to blood-letting from its apparent evils, I have said nothing of the apparent bad effects of other remedies. A nausea is often rendered worse by an emetic, and pains in the bowels are increased by a purge. But these remedies notwithstanding maintain, and justly too, a high character among physicians.

19. Bleeding has been accused of bringing on a nervous, or the chronic state of fever. The use of this remedy, in a degree so moderate as to obviate the putrid or gangrenous state of fever only, may induce the chroni

state of fever; for it is the effect, in this case, of the remains of inflammatory diathesis in the blood-vessels; but when blood is drawn proportioned to the morbid action in the system, it is impossible for a chronic fever to be produced by it. Even the excessive use of blood-letting, however injurious it may be in other respects; cannot produce a chronic fever, for it destroys morbid action altogether in the blood-vessels.

20. Bleeding has been charged with being a weakening remedy. I grant that it is so, and in this, its merit chiefly consists. The excessive morbid action of the blood-vessels must be subdued in part in a fever, before stimulating remedies can be given with safety or advantage. Now this is usually attempted by depleting medicines, to be mentioned hereafter, or it is left to time and nature, all of which are frequently either deficient, or excessive in their operations; whereas bleeding, by suddenly reducing the morbid action of the blood-vessels to a wished-for point of debility, saves a great and unnecessary waste of excitability, and thus prepares the body for the exhibition of such cordial remedies as are proper to remove the debility which predisposed to the fever.

21. It has been said that bleeding renders the habitual use of it necessary to health and life. This objection to blood-letting is founded upon an ignorance of the difference between the healthy, and morbid action of the blood-vessels. Where blood is drawn in health, such a relaxation is induced in the blood-vessels, as to favour the formation of plethora, which may require habitual bleeding to remove it; but where blood is drawn only in the inflammatory state of fever, the blood-vessels are reduced from a morbid degree of strength to that which is natural, in which state no predisposition to plethora is created, and no foundation laid for periodical blood-letting. But there are cases which require even this evil, to prevent a greater. Thus we cure a strangulated hernia, when no fever attends, by the most profuse bleeding. The plethora and predisposition to disease which follow it are trifling, compared with preventing certain and sudden death.

22. Bleeding has been accused of bringing on an in-

termittent fever. This is so far from being an objection to it, that it should be considered as a new argument in its favour, for when it produces that state of fever, it converts a latent, and perhaps a dangerous disease, into one that is obvious to the senses, and under the dominion of medicine. Nor is it an objection to blood-letting, that, when used in an inflammatory intermittent, it sometimes changes it into a continual fever. A instance of the good effects of this change occurred in the Pennsylvania hospital, in an obstinate tertian, in the year 1804. The continual fever, which followed the loss of blood, was cured in a few days, and by the most simple remedies.

23. It has been said that bleeding, more especially where it is copious, predisposes to effusions of serum in the lungs, chest, bowels, limbs, and brain. In replying to this objection to bleeding, in my public lectures, I have addressed my pupils in the following language: "Ask the poor patients who come panting to the door of our hospital, with swelled legs and hard bellies, every fall, whether they have been too copiously bled, and they will all tell you, that no lancet has come near their arms. Ask the parents who still mourn the loss of children who have died, in our city, of the internal dropsy of the brain, whether they were destroyed by excessive blood-letting. If the remembrance of the acute sufferings which accompanied their sickness and death will permit these parents to speak, they will tell you, that every medicine, except bleeding, had been tried to no purpose in their children's diseases. Go to those families in which I have practised for many years, and inquire, whether there is a living or a dead instance of dropsy having followed, in any one of them, the use of my lancet. Let the undertakers and grave-diggers bear witness against me, if I have ever, in the course of my practice, conveyed the body of a single dropsical patient into their hands, by excessive blood-letting. No. Dropsies, like abscesses and gangrenous eruptions on the skin, arise, in most cases, from *want* of sufficient bleeding in inflammatory diseases. Debility, whether induced by action or abstraction, seldom disposes to effusion. Who ever heard

of dropsy succeeding famine. And how rarely do we see it accompany the extreme debility of old age "

" If ever bleeding kills," says Bottallus, either directly or indirectly, through the instrumentality of other diseases, " it is not from its excess, but because it is not drawn in a sufficient quantity, or at a proper time, * " And, again, says this excellent writer, " One hundred thousand men perish from the want of blood-letting, or from its being used out of time, to one who perishes from too much bleeding, prescribed by a physician. † "

It is remarkable, that the dread of producing a dropsy by bleeding, is confined chiefly to its use in malignant fevers; for the men who urge this objection to it, do not hesitate to draw four or five quarts of blood in the cure of the pleurisy. The habitual association of the lancet with this disease, has often caused me to rejoice when I heard a patient complain of a pain in the side, in a malignant fever. It insured to me his consent to the frequent use of the lancet, and it protected me, when it was used unsuccessfully, from the clamours of the public, for few people censure copious bleeding in a pleurisy.

24. Against blood-letting it has been urged, that the Indians of our country cure their inflammatory fevers without it. To relieve myself from the distressing obloquy to which my use of this remedy formerly exposed me, I have carefully sought for, and examined their remedies for those fevers, with a sincere desire to adopt them; but my inquiries have convinced me, that they are not only disproportionate to the habits and diseases of civilized life, but that they are far less successful than blood-letting, in curing the inflammatory fevers which occur among the Indians themselves.

25. Evacuating remedies of another kind have been said to be more safe than bleeding, and equally effectual, in reducing the inflammatory state of fever. I shall enumerate each of these evacuating remedies, and then draw a comparative view of their effects with blood-letting. They are,

I. Vomits.

* Cap. viii. § 4.

† Cap. xxxvi. § 4.

II. Purges.

III. Sweats.

IV. Salivation. And,

V. Blisters.

I. Vomits have been often effectual in curing fevers of a mild character. They discharge offensive and irritating matters from the stomach; they lessen the fulness of the blood-vessels, by determining the serum of the blood through the pores; and they equalize the excitement of the system, by inviting its excessive degrees from the blood-vessels to the stomach and muscles. But they are,

1. Uncertain in their operation, from the torpor induced by the fever upon the stomach.

2. They are unsafe in many conditions of the system, as in pregnancy, and a disposition to apoplexy and ruptures. Life has sometimes been destroyed by their inducing cramp, hæmorrhage, and inflammation in the stomach.

3. They are not subject to the control of a physician, often operating more, or less than was intended by him, or indicated by the disease.

4. They are often ineffectual in mild, and always so in fevers of great morbid action.

II. Purges are useful in discharging acrid fæces and bile from the bowels in fevers. They act, moreover, by creating an artificial weak part, and thus invite morbid excitement from the blood-vessels to the bowels. They likewise lessen the quantity of blood, by preventing fresh accessions of chyle being added to it; but like vomits they are,

1. Uncertain in their operation; and from the same cause. Many ounces of salts and castor oil, and whole drachms of calomel and jalap, have often been given, without effect, to remove the costiveness which is connected with the malignant state of fever.

2. They are not subject to the direction of a physician, with respect to the time of their operation, or the quantity or quality of matter they are intended to discharge from the bowels.

3. They are unsafe in the advanced stage of fevers. Dr. Physick informed me, that three patients died in the water-closet, under the operation of purges, in St. George's hospital, during his attendance upon it. I have seen death, in several instances, succeed a plentiful spontaneous stool in debilitated habits.

III. Sweating was introduced into practice at a time when morbid matter was supposed to be the proximate cause of fever. It acts, not by expelling any thing exclusively morbid from the blood, but by abstracting a portion of its fluid parts, and thus reducing the action of the blood-vessels. This mode of curing fever is still fashionable in genteel life. It excites no fear, and offends no sense. The sweating remedies have been numerous, and fashion has reigned as much among them, as in other things. Alexipharmic waters, and powders, and all the train of sudorific medicines, have lately yielded to the different preparations of antimony, particularly to James's powder. I object to them all,

1. Because they are uncertain; large and repeated doses of them being often given to no purpose.

2. Because they are slow and disagreeable, where they succeed in curing fever.

3. Because, like vomits and purges, they are not under the direction of a physician, with respect to the quantity of fluid discharged by them.

4. Because they are sometimes, even when most profuse, ineffectual in the cure of fever.

5. The preparations of antimony, lately employed for the purpose of exciting sweats, are by no means safe. They sometimes convulse the system by a violent puking. Even the boasted James's powder has done great mischief. Dr. Goldsmith and Mr. Howard, it is said, were destroyed by it.

None of these objections to sweating remedies are intended to dissuade from their use, when nature shows a disposition to throw off a fever by the pores of the skin; but, even then, they often require the aid of bleeding to render them effectual for that purpose.

IV. Mercury, the Sampson of the *materia medica*, after having subdued the venereal disease, the tetanus, and

many other formidable diseases, has lately added to its triumphs and reputation, by overcoming the inflammatory and malignant state of fever. I shall confine myself, in this place, to its depleting operation, when it acts by exciting a salivation. From half a pound to two pounds of fluid are discharged by it in a day. The depletion in this way is gradual, whereby fainting is prevented. By exciting and inflaming the glands of the mouth and throat, excitement and inflammation are abstracted from more vital parts. In morbid congestion and excitement in the brain, a salivation is of eminent service, from the proximity of the discharge of the part affected. But I object to it, as an exclusive vacuant in the cure of fever,

1. Because it is sometimes impossible, by the largest doses of mercury, to excite it, when the exigences of the system render it most necessary.

2. Because it is not so quick in its operation, as to be proportioned to the rapid progress of the malignant state of fever.

3. Because it is at all times a disagreeable, and frequently a painful remedy, more especially where the teeth are decayed.

4. Because it cannot be proportioned in its duration, or in the quantity of fluid discharged by it, to the violence or changes in the fever.

Dr. Chisholm relied, for the cure of the Beullam fever at Grenada, chiefly upon this evacuation. I have mentioned the ratio of success which attended it.

V. Blisters are useful in depleting from those parts which are the seats of topical inflammation. The relief obtained by them in this way more than balances their stimulus upon the whole system. I need hardly say, that their effects in reducing the morbid and excessive action of the blood-vessels are very feeble. To depend upon them in cases of great inflammatory action, is as unwise as it would be to attempt to bale the water from a leaky and sinking ship by the hollow of the hand, instead of discharging it by two or three pumps.

VI Abstemious diet has sometimes been prescribed as a remedy for fever. It acts directly by the abstraction of the stimulus of food from the stomach, and indirectly

by lessening the quantity of blood. It can bear no proportion, in its effects, to the rapidity and violence of an inflammatory fever. In chronic fever, such as occurs in the pulmonary consumption, it has often been tried to no purpose. Long before it reduces the pulse, it often induces such a relaxation of the tone of the stomach and bowels as to accelerate death. To depend upon it therefore in the cure of inflammatory fever, whether acute or chronic, is like trusting to the rays of the sun to exhale the water of an overflowing tide, instead of draining it off immediately, by digging a hole in the ground. But there are cases in which the blood-vessels become so insulated, that they refuse to yield their morbid excitement to depletion from any outlet, except from themselves. I attended a sailor, in the Pennsylvania hospital, in 1799, who was affected with deafness, attended with a full and tense pulse. I prescribed for it, purging, blisters, and low diet, but without any effect. Perceiving no change in his pulse, nor in his disease, from those remedies, I ordered him to lose ten ounces of blood. The relief obtained by this evacuation induced me to repeat it. By means of six bleedings he was perfectly cured, without the aid of any other remedy.

Bleeding has great advantages over every mode of depleting that has been mentioned.

1. It abstracts one of the exciting causes, viz. the stimulus of the blood from the seat of fever. I have formerly illustrated this advantage of blood-letting, by comparing it to the abstraction of a grain of sand from the eye to cure an ophthalmia. The other depleting remedies are as indirect and circuitous in their operation in curing fever, as vomits and purges would be to remove an inflammation in the eye, while the grain of sand continued to irritate it.

2. Blood-letting is quick in its operation, and may be accommodated to the rapidity of fever, when it manifests itself in apoplexy, palsy, and syncope.

3. It is under the command of a physician. He may bleed *when* and *where* he pleases, and may suit the *quantity* of blood he draws, exactly to the condition of his patient's system.

4. It may be performed with the least attendance of nurses or friends. This is of great importance to the poor at all times, and to the rich during the prevalence of mortal epidemics.

5. It disturbs the system much less than any of the other modes of depleting, and therefore is best accommodated to that state of the system, in which patients are in danger of fainting or dying upon being moved.

6. It is a more delicate depleting remedy than most of those which have been mentioned, particularly vomits, purges, and a salivation.

7. There is no immediate danger to life from its use. Patients have sometimes died under the operation of vomits and purges, but I never saw nor heard an instance of a patient's dying in a fainty fit, brought on by bleeding.

8. It is less weakening, when used to the extent that is necessary to cure, than the same degrees of vomiting, purging, and sweating.

9. Convalescence is more rapid and more perfect after bleeding, than after the successful use of any of the other evacuating remedies.

By making use of blood-letting in fevers, we are not precluded from the benefits of the other evacuating remedies. Some of them are rendered more certain and more effectual by it, and there are cases of fever, in which the combined or successive application of them all is barely sufficient to save life.

To rely upon any one evacuating remedy, to the exclusion of the others, is like trusting to a pair of oars in a sea voyage, instead of spreading every sail of a ship.

I suspect the disputes about the eligibility of the different remedies which have been mentioned, have arisen from an ignorance that they belong to one class, and that they differ only in their force and manner of operation. Thus the physicians of the last century ascribed different virtues to salts of different names, which the chemists of the present day have taught us are exactly the same, and differ only in the manner of their being prepared.

Having replied to the principal objections to blood-letting, and stated its comparative advantages over other

modes of depletion, I proceed next to mention the circumstances which should regulate the use of it. These are,

1. The state of the pulse.

The following states of the pulse indicate the necessity of bleeding.

1. A full, frequent and vigorous pulse without tension, such as occurs in the yellow fever, gout and apoplexy. I have called it the *synochus fortis* pulse.

2. A full, frequent, and tense pulse, such as occurs in the pulmonary, rheumatic, gouty, phrenitic, and maniacal states of fever.

3. A full, frequent, and jerking pulse, without tension; such as frequently occurs in the vertiginous, paralytic, apoplectic, and hydropic states of fever.

4. A small, frequent, but tense pulse, such as occurs in the chronic pulmonary, and rheumatic states of fever.

5. A tense and *quick* pulse, without much preternatural frequency. This state of the pulse is common in the yellow fever.

6. A slow and tense pulse, such as occurs in the apoplectic, hydrocephalic, and malignant states of fever, in which its strokes are from 60 to 90 in a minute.

7. An uncommonly frequent pulse, without much tension, beating from 120 to 170 or 180 strokes in a minute.

This state of the pulse occurs likewise in the malignant states of fever.

8. A soft pulse, without much frequency or fulness. I have met with this state of the pulse in affections of the brain, and in that state of pulmonary fever which is known by the name of *pneumonia notha*. It sometimes, I have remarked, becomes tense after bleeding.

9. An intermitting pulse.

10. A depressed pulse.

11. An imperceptible pulse. The slow, intermitting, depressed, and imperceptible states of the pulse are supposed exclusively to indicate congestion in the brain. But they are all, I believe, occasioned likewise by great excess of stimulus acting upon the heart and arteries. A pulse more tense in one arm than in the other, I have generally found to attend a morbid state of the brain. Much yet remains to be known of the signs of a disease in the

brain, by the states of the pulse; hence Mr. Hunter has justly remarked, that "In inflammation of the brain, the pulse varies more than in inflammations of any other part; and perhaps we are led to judge of inflammation there, more from *other* symptoms than the pulse."*

The slow, uncommonly frequent, intermitting, and imperceptible states of the pulse, which require bleeding, may be distinguished from the same states of the pulse, which arise from an exhausted state of the system, and that forbid bleeding, by the following marks:

1. They occur in the beginning of a fever.
2. They occur in the paroxysms of fevers which have remissions and exacerbations.
3. They sometimes occur after blood-letting, from causes formerly mentioned.
4. They sometimes occur, and continue during the whole course of an inflammation of the stomach and bowels. And,
5. They occur in relapses, after the crisis of a fever.

The other stages of the pulse indicate bleeding in every stage of fever, and in every condition of the system. I have taken notice, in another place, of the circumstances which render it proper in the advanced stage of chronic fever.

If all the states of pulse which have been enumerated indicate bleeding, it must be an affecting consideration to reflect, how many lives have been lost, by physicians limiting the use of the lancet only to the tense or full pulse!

I wish it comported with the proposed limits of this essay to illustrate and establish, by the recital of cases, the truth of these remarks, upon the indications of bleeding from the pulse. It communicates much more knowledge of the state of the system than any other sign of disease. Its frequency (unconnected with its other states,) being under the influence of diet, motion, and the passions of the mind, is of the least consequence. In counting the number of its strokes, we are apt to be diverted from attending to its irregularity and force; and in these, it should always be remembered, fever chiefly consists. The knowledge acquired by attending to these states of the pulse is so definite and useful, and the circumstances which seduce from a due attention to them are so erroneous in their indications, that I have sometimes wished the Chinese cus-

* Treatise on Inflammation, chap. iii. 9.

tom of prescribing, from feeling the pulse only, without seeing or conversing with the patient, were imposed upon all physicians.

To render the knowledge of the indications of blood-letting, from the state of the pulse, as definite and correct as possible, I shall add, for the benefit of young practitioners, the following directions for feeling it.

1. Let the arm be placed in a situation in which all the muscles which move it shall be completely relaxed; and let it, at the same time, be free from the pressure of the body upon it.

2. Feel the pulse, in all obscure or difficult cases, in both arms.

3. Apply all the fingers of one hand, when practicable, to the pulse. For this purpose, it will be most convenient to feel the pulse of the right hand with your left, and of the left hand with your right.

4. Do not decide upon blood-letting, in difficult cases, until you have felt the pulse for some time. The Chinese physicians never prescribe until they have counted 49 strokes.

5. Feel the pulse at the intervals of four or five minutes, when you suspect that its force has been varied by any circumstances not connected with the disease, such as emotions of the mind, exercise, eating, drinking, and the like.

6. Feel the pulsations of the arteries in the temples and in the neck, when the pulse is depressed or imperceptible in the wrists.

7. Request silence in a sick room, and close your eyes, in feeling a pulse in difficult cases. By so doing, you will concentrate the sensations of your ears and eyes, in your fingers.

In judging of the states of the pulse which have been enumerated, it will be necessary always to remember the natural difference, in its frequency and force, in old people and children; also in the morning and evening, and in the sleeping and waking states of the system.

Much yet remains to be known upon this subject. I have mentioned the different states of the pulse which call for bleeding, but it is more difficult to know when to prescribe it, when the pulse imparts no sign of disease. In

general it may be remarked when the disease is *recent*, the part affected important to life, and incapable of sustaining violent morbid action long, without danger of disorganization, where pain is great, and respiration difficult, where there is redness in the face, and a watery, lively, or suffused eye, the pulse may be disregarded in the use of the lancet. To these signs, Dr. Sydenham adds, in the history of the case of a lady in whom the pulse gave no indication of the force of the disease, "a red colour in the cheeks; drops of blood issuing from the nose, no diminution of the heat of the body after bleeding, and the existence of an inflammatory constitution of the atmosphere."*

But to return.

II. Regard should be had to the character of the reigning epidemic, in deciding upon blood-letting. If the prevailing fever be of a highly inflammatory nature, bleeding may be used with more safety, in cases where the indications of it from the pulse are somewhat doubtful. The character of a previous epidemic should likewise direct the use of the lancet. The pestilential fever which followed the plague in London, in 1665, Dr. Sydenham says, yielded only to blood-letting. It is equally necessary in all the febrile diseases which succeed malignant fevers.

III. Regard should be had to the season of the year, and to the state of the weather. It is more copiously indicated in the winter and spring, than in summer and autumn in middle latitudes, and Dr. Hillary and Dr. Huxham both say, it is more necessary in dry, than in moist weather.

The words of Dr. Huxham upon this subject are as follow, "Diseases even of the same species (as I have constantly observed) require much larger bleeding, and the sick bear it much better in dry weather, when the barometer stands high, than when a hot moist air almost destroys the tone of the vessels. This is constantly observable even in diseases of the breast.†" The advan-

* Wallis's edition, vol. i. 134.

† Observations upon the Air, and Epidemic Diseases, preface, page xxviii.

tages of copious bleeding in the yellow fever of 1793, when the weather was uncommonly dry, confirms the truth of the remarks of those excellent practical physicians.

IV. The constitution of a patient, and more especially his habits with respect to blood-letting, should be taken into consideration, in prescribing it. If he be plethoric, and accustomed to bleeding in former indispositions, it will be more necessary, than in opposite states and habits of the system. Nature will expect it.

V. The corpulency of a patient should regulate the use of the lancet. A butcher of great observation informed me, that a fat ox did not yield more than from one half, to one third of the quantity of blood of a lean one, of the same size of bone, and it is well known that the loss of a small quantity of blood, after cutting off the head of a fowl, is always a sign of its being fit for the table. The pressure of fat upon the blood-vessels produces the same effects in the human species that it does in those animals; of course, less blood should be drawn from fat, than from lean people, under equal circumstances of disease.

VI. As persons have more or less blood in their vessels, according to their size, less blood should be drawn, under equal circumstances, from small than large people.

VII. Regard should be had to the age of adults in prescribing bleeding. In persons between fifty and sixty years of age, for reasons formerly mentioned, more blood may be drawn than in middle life, in similar diseases. In persons beyond 70, it will be necessary to regulate the quantity to be drawn by other signs than the pulse, or the appearances of the blood, the former being generally full, and sometimes tense, and the latter often putting on the sign of the second grade of morbid action formerly described.

VIII. Regard should be had to the country or place from which persons affected with fevers have arrived, in prescribing the loss of blood. Fevers, in America, are more inflammatory than fevers, in persons of equal rank, in Great-Britain. A French physician once said, it was safer to draw a hogshead of wine from a Frenchman's veins, than a quarter of a hundred pounds of beef

from an Englishman's, meaning to convey an idea of the difference in the grades of morbid or inflammatory action in the diseases of the inhabitants of France and England, and of the difference of the quantity of blood proper to be drawn in each of them. A similar difference exists between the grades of fever in Great-Britain and America. From a want of attention to this circumstance, I saw a common pleurisy end in an abscess of the lungs, in a sea captain, in the city of London, in the year 1769, who was attended by a physician of the first reputation in England. He was bled but once. His pulse and American constitution called for the loss of 50 or 60 ounces of blood. My former pupil, Dr. Fisher, in a letter from the university of Edinburgh dated in the winter of 1795, informed me, that he had cured several of his American fellow students of fevers, contrary to the general prejudices and practice in that city, by early bleeding, in as easy and summary a way as he had been accustomed to see them cured in Philadelphia by the same remedy. It is not less true, and worthy of the attention of an American physician, that the diseases of new comers into the United States from Great-Britain, Ireland, and other European countries, require more bleeding than the natives or old settlers, under equal circumstances of disease. This fact struck the late Dr. Reynolds in a very forcible manner, in his extensive practice among his newly arrived fellow citizens from Ireland. The remark is founded on reason, and it is to be wished, those European physicians who charge their patients when they are about to emigrate to America, "never to be bled," would consider how much the change which the stimulating impressions of a new climate, diet, company, and often of employments, make upon the system, is opposed to their advice.

IX. Regard should be had to the structure and situation of the parts diseased with febrile action. The brain, from its importance to all the functions of life, the rectum, the bladder, and the trachea, when inflamed, and the intestines, when strangulated, from their being removed so much out of the influence of the great circulation, all require more copious bleeding than the same degrees of disease in the lungs, and some other parts of the body.

X. After blood-letting has been performed, the appearances of the blood should be attended to, in order to judge of the propriety of repeating it. I shall briefly describe these appearances, and arrange them in the order in which they indicate the different degrees of inflammatory diathesis, beginning with the highest.

1. Dissolved blood. It occurs in the malignant states of fever. I have seen it several times in the pleurisy, and have once heard of it in a case of gout. I have ascribed this decomposition of the blood to such a violent, or feeble degree of action in the blood-vessels as to dispose them to a paralytic state. It is generally considered as a signal to lay aside the lancet. If it occur in the *first stage* of a fever, it indicates a very opposite practice. By repeated bleedings, the vessels recover their natural action, and the blood becomes resuscitated, or *reduced* to its original texture. Of this I have had frequent experience, since the year 1793. It required three successive bleedings to restore the blood from a dissolved, to a coagulable state, in Mr. Benton. It afterwards became very sizzly. If this dissolved blood appear towards the close of a malignant fever, no other benefit than the protraction of life for a day or two, or an easy death, can be expected from repeating the bleeding, even though it be indicated by a tense pulse; for the viscera are generally so much choaked by the continuance of violent action in the blood-vessels, that they are seldom able to discharge the blood which distends them, into the cavity in the vessels, which is created by the abstraction of blood from a vein. There is some variety in the appearance of this state of the blood, which indicates more or less violent pressure upon the blood-vessels. It threatens most danger to life when it resembles molasses in its consistence. The danger is less when the part which is dissolved occupies the bottom of the bowl, and when its surface is covered with a sizzly pellicle or coat. I have said the blood is sometimes dissolved from a too feeble action of the blood-vessels upon it. We observe this in the scurvy and in the lowest grade of typhus fever. It is restored in these cases to its natural consistence by means of stimulating remedies. To this account of the morbid state of the blood, it may not be improper to add, that Dr. Stoll found it coagulated in the

veins of an epileptic patient, and that Morgagni mentions the case of a girl in whom the blood was cold. She had at the same time no sense of coldness in any part of her body. By means of stimulants, she was recovered.

Does not the restoration of the blood from its disorganized state, by means of bleeding, suggest an idea of a similar change being practicable in the solids, when they are disorganized by disease? And are we not led hereby to an animating view of the extent and power of medicine?

2. Blood of a scarlet colour, without any separation into crassamentum or serum, indicates a second degree of morbid action. It occurs likewise in the malignant state of fever. It is called improperly dense blood. It occurs in old people.

3. Blood in which part of the crassamentum is dissolved in the serum, forming a resemblance to what is called the *lotura carniū*, or the washings of flesh in water.

4. Serum of a clear red, or green colour. The violence and danger of fevers in which the serum of the blood assumes the latter colour, is taken notice of by Dr. Huxham.*

5. Crassamentum sinking to the bottom of a bowl in yellow serum.

6. Crassamentum floating in serum, which is at first turbid, but which afterwards becomes yellow and transparent, by depositing certain red and fiery particles of the blood in the bottom of the bowl.

7. Sisy blood, or blood covered with a buffy coat. The more the crassamentum appears in the form of a cup, the more inflammatory action is said to be indicated by it. This appearance of the blood occurs in all the common states of inflammatory fever. It occurs too in the mild state of malignant fevers, and in the close of such of them as have been violent. It is not always confined to the common inflammatory state of the pulse, for I have observed it occasionally in most of the different states of the pulse which have been described. The appearance of this buffy coat on the blood in the yellow fever is always favourable. It shows the disease to be tending from an

*On Air and Epidemics, vol. i. p. 129.

uncommon to a *common* degree of inflammatory diathesis. It has been remarked, that blood which resembles claret in its colour, while flowing, generally puts on; when it cools, a *sizy* appearance. Blood which assumes a paler red colour near the edges of the bowl, than that which is in the middle of the bowl into which it is flowing, is likewise generally *sizy*.

It would seem, from these facts, that the power of coagulation of the blood was lessened in an exact ratio to the increase of action upon the blood-vessels, and that it was increased in proportion to the diminution of that action, to that degree of it which constitutes what I have called *common* inflammatory action.

Here, as upon a former occasion, we may say with concern, if bleeding be indicated by all the appearances of the blood which have been enumerated, how many lives have been lost by physicians limiting the use of the lancet to those cases only, where the blood discovered an inflammatory crust!

It would be a digression from the subject now under consideration, or I would add in this place some remarks upon what is called the vitality of the blood. I shall only mention, that I have for many years taught in my physiological lectures that the blood in the healthy state appears to be like the bones and tendons, *animalized* only, and that like those parts of the body, it becomes *animated* by the stimulus of disease. The more *sizy* it becomes, the more it partakes of an animated quality. Its *cupped* appearance indicates its having assumed a muscular nature. It is in this animated state of the fibrin only, that it forms those membranes which succeed inflammation in different parts of the body.

The remarks which have been delivered upon the relative signs of inflammatory action in the blood-vessels, should be admitted with a recollection that they are all liable to be varied by a moderate, or violent exacerbation of fever, by the size of the stream of blood, and by the heat, coldness, and form of the cup into which the blood flows. Even blood drawn, under exactly equal circumstances, from both arms, exhibited, in a case of pleurisy communicated to me by Dr. Mitchell, of Kentucky, very

different appearances. That which was taken from one arm was sizzly, while that which was taken from the other was of a scarlet colour. I have known a similar difference to occur in the appearances of the blood in pregnancy. That which was taken from the arm of the right side, was much more sizzly than that which was taken from the left. Blood which is drawn from a vein in the arm, puts on, likewise, appearances very different from that which is discharged from the bowels, in a dysentery. These facts were alluded to in the Outlines of the Phenomena of Fever,* in order to prove that unequal excitement takes place, not only in the different systems of the body, but in the same system, particularly in the blood-vessels. They likewise show us the necessity of attending to the state of the *pulse* in both arms, as well as in other parts of the body, in prescribing blood-letting. When time, and more attention to that index of the state of the system in fevers, shall have brought to light all the knowledge that the pulse is capable of imparting, the appearances of the blood, in fevers, will be regarded as little as the appearances of the urine.

XI. Blood-letting should always be copious where there is danger from sudden and great congestion or inflammation, in vital parts. This danger is indicated most commonly by pain; but there may be congestion in the lungs, liver, bowels, and even in the head, without pain. In these cases, the state of the pulse should always govern the use of the lancet. An advantage will arise in these cases from drawing blood at the same time from both arms. An alarm, Mr. Hunter says, is thereby excited in the arteries, which disposes them to contract more suddenly, and thus to relieve themselves of redundant blood. Eight ounces drawn in two minutes in the cases under consideration, give more relief than a much larger quantity in a longer time. The good effects of a large stream of blood in violent and inflammatory diseases did not escape Dr. Sydenham. The reverse of this practice should be followed in fevers of weak inflammatory action.

XII. What quantity of blood may be taken, with safety, from a patient in an inflammatory fever? To answer this question it will be necessary to remark, 1. That, in a person of an ordinary size, there are supposed to be contained between 25 and 28 pounds of blood; and, 2. That much more blood may be taken when the blood-vessels are in a state of a morbid excitement and excitability, than at any other time. One of the uses of the blood is to stimulate the blood-vessels, and thereby to assist in originating and preserving animal life. In a healthy state of the vessels, the whole mass of the blood is necessary for this purpose; but in their state of morbid excitability, a much less quantity of blood than what is natural (perhaps in some cases four or five pounds) are sufficient to keep up an equal and vigorous circulation. Thus very small portions of light and sound are sufficient to excite vision and hearing, in an inflamed and highly excitable state of the eyes and ears. Thus too, a single glass of wine will often produce delirium in a fever in a man, who, when in health, is in the habit of drinking a bottle every day, without having his pulse quickened by it.

An ignorance of the quantity of blood which has been drawn by design, or lost by accident, has contributed very much to encourage prejudices against blood-letting. Mr. Cline drew 320 ounces of blood in 20 days from a patient in St. Thomas's hospital, who laboured under a contusion of the head. But this quantity is small compared with the quantity lost by a number of persons, whose cases are recorded by Dr. Haller.* I shall mention a few of them. One person lost 9 pounds of blood, a second 12, a third 18, and a fourth 22, from the nose, at one time. A fifth lost 12 pounds by vomiting in one night, and a sixth 22 from the lungs. A gentleman at Angola lost between 3 and 4 pounds daily from his nose. To cure it, he was bled 97 times in one year. A young woman was bled 1020 times in 19 years, to cure her of plethora which disposed her to hysteria. Another young woman lost 125 ounces of blood, by a natural hæmorrhage, every month. To cure it, she was bled every day,

* *Elementa Physiologia*, vol. iv. p. 45.

and every other day, for 14 months. In none of these instances was death the consequence of these great evacuations of blood. On the contrary, all the persons alluded to, recovered. Many similar instances of the safety, and even benefit of profuse discharges of blood, by nature and art, might be mentioned from other authors. I shall insert only one more, which shall be taken from Dr. Sydenham's account of the cure of the plague. "Among the other calamities of the civil war which afflicted this nation, the plague also raged in several places, and was brought by accident from another place to Dunstar Castle, in Somersetshire, where some of the soldiers dying suddenly, with an eruption of spots, it likewise seized several others. It happened at that time that a surgeon, who had travelled much in foreign parts, was in the service there, and applied to the governor for leave to assist his fellow-soldiers who were afflicted with this dreadful disease, in the best manner he was able; which being granted, he took so large a quantity of blood from every one at the beginning of the disease, and before any swelling was perceived, that they were ready to faint, and drop down, for he bled them all standing, and in the open air, and had no vessel to measure the blood, which falling on the ground, the quantity each person lost could not of course be known. The operation being over, he ordered them to lie in their tents; and though he gave no kind of remedy after bleeding, yet of the numbers that were thus treated, not a single person died. I had this relation from Colonel Francis Windham, a gentleman of great honour and veracity, and at this time governor of the castle."*

Again. An ignorance of the rapid manner in which blood is regenerated, when lost or drawn, has helped to keep up prejudices against blood-letting. A person (Dr. Haller says) lost five pounds of blood daily from the hæmorrhoidal vessels for 62 days, and another 75 pounds of blood in 10 days. The loss each day, was supplied by fresh quantities of aliment, and where no aliment is taken into the stomach, by the blood that is prepared from the chyle which is secreted in the liver from the fat of the omentum. I have supposed in my physiological lectures that the omentum performs the vicarious purpose that has

been mentioned. This opinion has been defended and applied to practical purposes by my son Dr. James Rush, in his inaugural dissertation published in April 1809. One of the inferences drawn from it, is a caution not to lay aside the lancet in chronic diseases with inflammatory symptoms, from a fear of a penury of blood, in cases where the resources for its reproduction have failed from the abstraction of food, or a deficiency of the functions of the stomach, and where the liver retains the chylopoetic office he has ascribed to it.

These facts, I hope, will be sufficient to establish the safety and advantages of plentiful blood-letting, in cases of violent fever; also to show the fallacy and danger of that practice which attempts the cure of such cases of fever, by what is called *moderate* bleeding. There are, it has been said, no half truths in government. It is equally true, that there are no half truths in medicine. This half-way practice of moderate bleeding, has kept up the mortality of pestilential fevers, in all ages and in all countries. I have combated this practice elsewhere,* and have asserted upon the authority of Dr. Sydenham, that it is much better not to bleed at all, than to draw blood disproportioned in quantity to the violence of the fever. If the state of the pulse be our guide, the continuance of its inflammatory action, after the loss of even 100 ounces of blood, indicates the necessity of more bleeding, as much as it did the first time a vein was opened. In the use of this remedy it may be truly said, as in many of the enterprizes of life, that nothing is done, while any thing remains to be done. Bleeding should be repeated while the symptoms which first indicated it continue, should it be until four-fifths of the blood contained in the body are drawn away. In this manner we act in the use of other remedies. Who ever leaves off giving purges in a colic, attended with costiveness, before the bowels are opened? or who lays aside mercury as a useless medicine, because a few doses of it do not cure the venereal disease?

I shall only add under this head, that I have always observed the cure of a malignant fever to be most complete, and the convalescence to be most rapid, when the bleeding has been continued until a *paleness* is induced

* Account of the Yellow Fever in 1793.

in the face, and until the patient is able to sit up without being fainty. After these circumstances occur, a moderate degree of force in the pulse will gradually wear itself away, without doing any harm.

XIII. In drawing blood, the quantity should be large or small at a time, according to the state of the system. In cases where the pulse acts with force and freedom, from 10 to 20 ounces of blood may be taken at once; but in cases where the pulse is much depressed, it will be better to take away but a few ounces at a time, and to repeat it three or four times a day. By this means the blood-vessels more *gradually* recover their vigour, and the apparent bad effects of bleeding are thereby prevented. Perhaps the same advantages might be derived in many other cases, from the gradual abstraction of stimuli, that are derived from the gradual increase of their force and number, in their application to the body. For a number of facts in support of this practice, the reader is referred to the history of the yellow fever, in the year 1793. In an inflammatory fever, the character of which is not accurately known, it is safest to begin with moderate bleeding, and to increase it in quantity, according as the violence and duration of the disease shall make it necessary. In fevers, and other diseases, which run their courses in a few days or hours, and which threaten immediate dissolution, there can be no limits fixed to the quantity of blood which may be drawn at once, or in a short time. Botallus drew three, four and five pints in a day, in such cases. Dr. Jackson drew fifty-six ounces of blood at one time, from a Mr. Thompson, of the British hospitals, in a fever of great violence and danger. This patient was instantly relieved from what he styled "chains and horrors." In three or four hours he was out of danger, and in four days, the doctor adds, returned to his duty.* Dr. Physick drew ninety ounces, by weight, from Dr. Dewees, in a sudden attack of the apoplectic state of fever, at one bleeding, and thereby restored him so speedily to health, that he was able to attend to his business in three days afterwards. Under this head I shall remark that

* Remarks on the Constitution of the Medical Department of the British Army.

bleeding ad deliquium animi is often attended with obvious good effects in the *first* stage of violent diseases. By the total relaxation it induces in the blood-vessels, it enables the stimuli which support animal life, to impart to them a new, and natural action, and thereby suddenly to restore their equable excitement, but this mode of bleeding should never be employed in the advanced, or last stages of fever. I have once known death to be thus induced by it. The system requires all its resources in excitability to be restored from a fainting fit, and these exist only in the early or acute stages of disease. In chronic states of fever, of an inflammatory type, small and frequent bleedings, are to be preferred to large ones. We use mercury, antimony, and diet drinks as alteratives in many diseases with advantage. We do not expect to remove debility by two or three immersions in a cold bath. We persist with patients in prescribing all the above remedies for months and years, before we expect to reap the full benefits of them. Why should not blood-letting be used in the same way, and have the same chance of doing good? I have long ago adopted the *alterative* mode of using it, and I can now look around me, and with pleasure behold a number of persons of both sexes who owe their lives to it. In many cases I have prescribed it once in two or three months, for several years, and in some I have advised it every two weeks, for several months.

There is a state of fever in which an excess in the action of the blood-vessels is barely perceptible, but which often threatens immediate danger to life, by a determination of blood to a vital part. In this case I have frequently seen the scale turn in favour of life, by the loss of but four or five ounces of blood. The pressure of this, and even of a much less quantity of blood in the close of a fever, I believe, as effectually destroys life as the excess of several pounds does in its beginning. The advantage to be derived from the loss of a small quantity of blood in certain states of the system is obvious, from the sudden relief which the discharge of a few ounces of blood by menstruation affords to the pains which sometimes attend that monthly disease.

In cases where bleeding does not cure, it may be used with advantage as a *palliative* remedy. Many diseases induce death in a full and highly excited state of the system. Here opium does harm, while bleeding affords certain relief. It belongs to this remedy, in such cases, to ease pain, to prevent convulsions, to compose the mind, to protract the use of reason, to induce sleep, and thus to smoothe the passage out of life.

XIV. Bleeding from an artery, commonly called arteriotomy, would probably have many advantages over venesection, could it be performed at all times with ease and safety. Blood discharged by hæmorrhages affords more relief, in fevers, than an equal quantity drawn from a vein, chiefly because it is poured forth, in the former case, from a ruptured artery. I mentioned formerly, that Dr. Mitchell had found blood drawn from an artery to be what is called dense, at a time when that which was drawn from a vein, in the same persons, was dissolved. This fact may possibly admit of some application. In the close of malignant fevers, where bleeding has been omitted in the beginning of the disease, blood drawn from a vein is generally so dissolved, as to be beyond the reach of repeated bleedings to restore it to its natural texture. In this case, arteriotomy might probably be performed with advantage. The arteries, which retain their capacity of life longer than the veins, by being relieved from the immediate pressure of blood upon them, might be enabled so to act upon the torpid veins, as to restore their natural action, and thereby to arrest departing life. Arteriotomy might further be used with advantage in children, in whom it is difficult, and sometimes impracticable to open a vein. Besides these advantages, there are several others which attend this mode of drawing blood. 1. The arteries being more irritable than the veins, the abstraction of blood immediately from them, removes the stimulus from the part which is the seat of the most irritation or diseased action. 2. More blood can be taken from the arteries without bringing on fainting, than from the veins, in consequence of the heart (on the suspension of whose actions fainting depends) driving the blood which moves it from the veins. This is of great consequence in the close of fevers in which bleeding may be

necessary, but in which fainting is sometimes fatal. It may be used with greater safety for the same reason in pregnancy, where there is a disposition to faint, the effect of which is sometimes to induce abortion. 3. The arteries when opened, are more apt to assume a morbid action from the wound inflicted upon them than the veins, in consequence of which, a diseased action is more easily translated from an internal, to an external and less vital part of the body. 4. More relief is obtained by the loss of a small quantity of blood, from an artery than from a vein. These four remarks in favour of arteriotomy are taken from Dr. Butler's thesis, published in Edinburgh. They appear to be rational, but I can say but little in support of them from my own experience.

XV. Much has been said about the proper place from whence blood should be drawn. Bleeding in the foot was much used formerly, in order to excite a revulsion from the head and breast; but our present ideas of the circulation of the blood have taught us, that it may be drawn from the arm with equal advantage in nearly all cases. To bleeding in the foot there are the following objections: 1. The difficulty of placing a patient in a situation favourable to it. 2. The greater danger of wounding a tendon in the foot than in the arm. And, 3. The impossibility of examining the blood after it is drawn; for, in this mode of bleeding, the blood generally flows into a bason or pail of water.

Under this head I shall decide upon the method of drawing blood by means of cups and leeches, in the inflammatory state of fever. Where an inflammatory fever arises from local affection, or from contusion in the head or breast, or from a morbid excitement in those, above other parts of the arterial system, they may be useful; but where local affection is a symptom of general and equable fever only, it can seldom be necessary, except where bleeding from the arm has been omitted, or used too sparingly, in the beginning of a fever; by which means such fixed congestion often takes place, as will not yield to general bleeding.

XVI. Much has been said likewise about the proper time for bleeding in fevers. It may be used at all times,

when indicated by the pulse and other circumstances, in continual fevers; but it should be used chiefly in the paroxysms of such as intermit. I have conceived this practice to be of so much consequence, that, when I expect a return of the fever in the night, I request one of my pupils to sit up with my patients all night, in order to meet the paroxysm, if necessary, with the lancet. But I derive another advantage from fixing a centinel over a patient in a malignant fever. When a paroxysm goes off in the night, it often leaves the system in a state of such extreme debility, as to endanger life. In this case, from five to ten drops of laudanum, exhibited by a person who is a judge of the pulse, obviate this alarming debility, and often induce easy and refreshing sleep. By treating the human body like a corded instrument, in thus occasionally relaxing or bracing the system, according to the excess or deficiency of stimulus, in those hours in which death most frequently occurs, I think I have been the means of saving several valuable lives.

XVII. The different positions of the body influence the greater or less degrees of relief which are obtained by blood-letting. Where there is a great disposition to syncope, and where it is attended with alarming and distressing circumstances, blood should be drawn in a recumbent posture, but where there is no apprehension or dread of fainting, it may be taken in a sitting posture. The relief will be more certain if the patient be able to stand while he is bled, for by thus opposing the gravity of the blood, to the action of the heart, the quantity of it usually sent to the head, is lessened. It is diminished likewise in the larger blood-vessels by the abstraction of that portion of it which is necessary to the excitement of the muscles in a standing posture, and hence fainting, and all the good effects we wish from it in the first stage of disease, may be more easily obtained, and these too from the loss of a much smaller quantity of blood. It should therefore be preferred, where patients object to copious or frequent bleedings. The history of the success of this practice in the British army, recently mentioned from Dr. Sydenham, furnishes a strong argument in its favour.

I regret that the limits I have fixed to this defence of blood-letting will not admit of my applying the principles

which have been delivered, to all the inflammatory states of fever. In a future essay, I hope to establish its efficacy in the maniacal state of fever. I have said that madness is the effect of a chronic inflammation in the brain. Its remedy, of course, should be frequent and copious blood-letting. Physical and moral evil are subject to similar laws. The mad shirt, and all the common means of coercion, are as improper substitutes for bleeding, in madness, as the whipping-post and pillory are for solitary confinement and labour, in the cure of vice. The pulse should govern the use of the lancet in this as well as in all the *ordinary* states of fever. It is the dial-plate of the system. But in the *misplaced* states of fever, the pulse, like folly in old age, often points at a different mark from nature. In all such cases, we must conform our practice to that which has been successful in the reigning epidemic. A single bleeding, when indicated by this circumstance, often converts a fever from a suffocated, or latent, to a sensible state, and thus renders it a more simple and manageable disease.

It was worthy of consideration here, how far local diseases, which have been produced by fevers, might be cured by re-exciting the fever. Sir William Jones says, the physicians in Persia always begin the cure of the leprosy by blood-letting.* Possibly this remedy diffuses the disease through the blood-vessels, and thereby exposes it to be more easily acted upon by other remedies.

Having mentioned the states of fever in which blood-letting is indicated, and the manner in which it should be performed, I shall conclude this inquiry by pointing out the states of fever in which it is forbidden, or in which it should be cautiously or sparingly performed. This subject is of consequence, and should be carefully attended to by all who wish well to the usefulness and credit of the lancet.

1. It is forbidden in that state of fever, as well as in other diseases, in which there is reason to believe the brain or viscera are engorged with blood, and the whole system prostrated below the point of re-action. I have suggested this caution in another place.† The pulse in these cases is feeble, and sometimes scarcely perceptible, occasioned

* Asiatic Essays.

† Vol. iii.

by the quantity of blood in the blood-vessels being reduced, in consequence of the stagnation of large portions in the viscera. By bleeding in these cases, we deprive the blood-vessels of the feeble remains of the stimulus which keep up their action, and thereby preeipitate death. The remedies here should be frictions, and stimulating applications to the extremities, and gentle stimuli taken by the mouth, or injected into the bowels. As soon as the system is a little excited by these remedies, blood may be drawn, but in small quantities at a time, and perhaps only by means of cups or leeches applied to the seats of congestions of the blood. After the vessels are excited by the equable diffusion of the blood through all their parts, it may with safety be drawn from the arm, provided it be indicated by the pulse.

2. It is seldom proper beyond the third day, in a malignant fever, if it has not been used on the days previous to it, and for the same reason that has been given under the former head. Even the tension of the pulse is not always a sufficient warrant to bleed, for in three days in a fever which runs its course in five days, the disorganization of the viscera is so complete, that a recovery is scarcely to be expected from the lancet. The remedies which give the only chance of relief in this case, are purges, blisters, and a salivation.

3. Where fevers are attended with paroxysms, bleeding should be omitted or used with great caution, in the close of those paroxysms. The debility which accompanies the intermission of the fever is often so much increased by the loss of blood, as sometimes to endanger life.

4. Bleeding is forbidden, or should be used cautiously in that malignant state of fever, in which a weak morbid action, or what Dr. Darwin calls a tendency to inirritability, takes place in the blood vessels. It is known by a weak and frequent pulse, such as occurs in the typhus fever and in the plague in warm climates. I have often met with it in the malignant sore throat, and occasionally in the pleurisy and yellow fever. The remedies here should be gentle vomits or purges, and afterwards cordials. Should the pulse be too much excited by them, bleeding may be used to reduce it.

5. It should be used sparingly in the diseases of habitual drunkards. The morbid action in such persons, though often violent, is generally transient. It may be compared to a soap-bubble. The arteries, by being often overstretched by the stimulus of strong drink, do not always contract with the diminution of blood, and such patients often sink, from this cause, from the excessive use of the lancet.

6. It has been forbidden after the suppurative process has begun in local inflammation. It constantly retards the suppuration, when begun, in the angina tonsillaris, and thus protracts that disease. To this rule there are frequent exceptions.

7. It should be omitted in pneumony, after copious expectoration has taken place. This discharge is local depletion, and, though slow in its effects compared with bleeding, it serves the same purpose in relieving the lungs. The lancet can only be required where great pain in coughing, and a tense pulse, attends this stage of the disease.

8. It may be omitted (except when the blood-vessels are insulated) in those diseases in which there is time to wait, without danger to life, or future health, for the circuitous operation of purging medicines, or abstemious diet.

9. It should be avoided, when it can be done without great danger to life, where there is a great and constitutional dread of the operation; also in persons predisposed to fainting, where that occasional effect of bleeding is not desired. In such cases, it has sometimes done harm to the patient, and injured the credit of the lancet.

10. There are cases in which sizzly blood should not warrant a repetition of blood-letting. Mr. White informs us, in the History of the Bilious Fever which has lately prevailed at Bath, that bleeding, in many cases, in which this appearance of the blood took place, was useless or hurtful. Sir John Pringle says the same unsuccessful issue attended a second bleeding when the blood was sizzly in the hospital fever. In some of the fevers of our own country, we sometimes see sizzly blood followed by symptoms which forbid the repeated use of the lancet, but which yield to other depleting remedies, or to such as are of a cordial nature. I have seen the same kind of blood,

a few hours before death, in a pulmonary consumption, and three days after a discharge of a gallon and a half of blood from the stomach by vomiting.

11. Even a tense pulse does not always call for the repeated use of the lancet. I have mentioned one case, viz. on the third or fourth days of a malignant fever, in which it is improper. There are instances of incurable consumptions from tubercles and ulcers in the lungs, in which the pulse cannot be made to feel the least diminution of tension by either copious or frequent bleedings. There are likewise cases of hepatic fever, in which the pulse cannot be subdued by this remedy. This tense state of the pulse is the effect of a suppurative process in the liver. If a sufficient quantity of blood has been drawn in the first stage of this disease, there is little danger from leaving the pulse to reduce or wear itself down by a sudden or gradual discharge of the hepatic congestion. The recovery in this case is slow, but it is for the most part certain. I have once known a dropsy and death induced by the contrary practice.

12, and lastly. There is sometimes a tension in the pulse in hæmorrhages, that will not yield to the lancet. The man whose blood was sisy, three days after loosing a gallon and a half of it from his stomach, had a tense pulse the day before he died; and I once perceived its last strokes to be tense, in a patient whom I lost in a yellow fever by a hæmorrhage from the nose. The only circumstance that can justify bleeding in these cases is extreme pain, in which case, the loss of a few ounces of blood is a more safe and effectual remedy than opium.

I shall now add a few remarks upon the efficacy of blood-letting, in diseases which are not supposed to belong to the class of fevers, and which have not been included in the preceding volumes.

I. The philosophers, in describing the humble origin of man, say that he is formed "inter stercus et urinam." The divines say that he is "conceived in sin and shapen in iniquity." I believe it to be equally true, and alike humiliating, that he is conceived and brought forth in disease.

This disease appears in pregnancy and parturition. I shall first endeavour to prove this to be the case, and afterwards mention the benefits of blood-letting in relieving it, in both cases.

In pregnancy, the uterus is always affected with that grade of morbid action which I formerly called inflammation. This is evident from its exhibiting all its usual phenomena in other parts of the body. These are,

1. Swelling, or enlargement.
2. Hæmorrhage. The lochia are nothing but a slow and spontaneous bleeding performed by nature, and intended to cure the inflammation of the uterus after parturition.
3. Abscesses, schirri, and cancers. It is true, those disorders sometimes occur in women that have never borne children. In these cases, they are the effects of the inflammation excited by the menstrual disease.
4. A full, quick, and tense or frequent pulse; pain; want of appetite;* sickness at stomach; puking; syncope; and sometimes convulsions in every part of the body.
5. Sisy blood. This occurs almost uniformly in pregnancy.
6. A membrane. Dr. Scarpa has proved the *membrana decidua*, which is formed during pregnancy, to be in every respect the same in its properties with the membrane which is formed upon other inflamed surfaces, particularly the trachea, the pleura, and the inside of the bowels. Thus we see all the common and most characteristic symptoms and effects of inflammation, in other parts of the body, are exhibited by the uterus in pregnancy.

These remarks being premised, I proceed to remark, that blood-letting is indicated, in certain states of pregnancy, by all the arguments that have been used in favour of it in any other inflammatory disease. The degree of inflammation in the womb, manifested by the pulse, pain, and other signs of disease, should determine the quantity of blood to be drawn. Low diet, gentle purges, and con-

* Dr. Hunter used to teach in his lectures, that the final cause of the want of appetite, during the first months of pregnancy, was to obviate plethora, which disposes to abortion. This plethora should have been called an inflammatory disease, in which abstinence is useful.

stant exercise, are excellent substitutes for it, but where they are not submitted to, blood-letting should be employed as a substitute for them. In that disposition to abortion, which occurs about the third month of pregnancy, small and frequent bleedings should be preferred to all other modes of depletion. I can assert from experience, that they prevent abortion, nearly with as much certainty as they prevent a hæmorrhage from the lungs: for what is an abortion but a hæmoptysis (if I may be allowed the expression) from the uterus? During the last month of pregnancy, the loss of from twelve to twenty ounces of blood has the most beneficial effects, in lessening the pains and danger of child-birth, and in preventing its subsequent diseases.

The doctrine I have aimed to establish leads, not only to the use of blood-letting in the disease of pregnancy, when required, but to a more copious use of it, when combined with other diseases, than in those diseases in a simple state. This remark applies, in a particular manner, to those spasms and convulsions which sometimes occur in the latter months of pregnancy. Without bleeding, they are always fatal. By copious bleeding, amounting in some instances to 80 and 100 ounces, they generally cured.

Let it not be supposed that blood-letting is alike proper and useful in every state of pregnancy.—There are what are called slow or chronic inflammations, in which the diseased action of the blood-vessels not only forbids it, but calls for cordial and stimulating remedies. The same feeble state of inflammation sometimes take place in the pregnant uterus. In these cases cordials and stimulants should be preferred to the lancet.

Parturition is a higher grade of disease than that which takes place in pregnancy. It consists of convulsive or clonic spasms in the uterus, superventing its inflammation, and is accompanied with chills, heat, thirst, a quick, full, tense, or a frequent and depressed pulse, and great pain. By some divines these symptoms, and particularly pain, have been considered as a standing and unchangeable punishment of the original disobedience of woman, and, by some physicians, as indispensably necessary to enable

tue uterus to relieve itself of its burden. By contemplating the numerous instances in which it has pleased God to bless the labours and ingenuity of man, in lessening or destroying the effects of the curse inflicted upon the earth, and by attending to the histories of the total exemption from pain in child-bearing that are recorded of the women in the Brasils, Calabria, and some parts of Africa, and of the small degrees of it which are felt by the Turkish women, who reduce their systems by frequent purges of sweet oil during pregnancy, I was induced to believe pain does not accompany child-bearing by an immutable decree of Heaven. By recollecting further how effectually blood-letting relieves many other spasmodic and painful diseases, and how suddenly it relaxes rigidity in the muscles, I was led, in the year 1795, to suppose it might be equally effectual in lessening the violence of the disease and pains of parturition. I was encouraged still more to expect this advantage from it, by having repeatedly observed the advantages of copious bleeding for inflammatory fevers, just before delivery, in mitigating its pains, and shortening its duration. Upon my mentioning these reflections and facts to Dr. Dewees, I was much gratified in being informed that he had been in the practice for several years before his removal from Abingdon to Philadelphia, of drawing *large* quantities of blood during parturition, and with all the happy effects I had expected from it. The practice has been strongly inculcated by the doctor in his lectures upon midwifery, and has been ably defended and supported by a number of recent facts, in an ingenious inaugural dissertation, published by Dr. Peter Miller, in the year 1804. It has been generally adopted by the practitioners of midwifery, of both sexes, in Philadelphia.

I do not mean to insinuate that bleeding is a new remedy in parturition. It has long ago been advised and used in France, and even by the midwives of Genoa, in Italy, but never, in any country, in the large quantities that have been recommended by Dr. Dewees, that is, from 20 to 80 ounces, or until signs of fainting are induced, nor under the influence of the theory of parturition, being a violent disease.

By the advantages of this remedy are not confined to lessening the pains of delivery. It prevents after pains; favours the easy and healthy secretion of milk; prevents sore breasts, swelled legs, puerperile fever, and all the distressing train of anomalous complaints that often follow child-bearing. Dr. Hunter informed his pupils, in his lectures upon midwifery, in the year 1769, that he had often observed the most rapid recoveries to succeed the most severe labours. The severity of the pains in these cases created a disease, which prevented internal congestions in the womb. Bleeding, by depleting the uterus, obviates at once both disease and congestion. Its efficacy is much aided by means of glysters, which, by emptying the lower bowels, lessen the pressure upon the uterus.

Let it not be inferred, from what has been said in favour of blood-letting in parturition, that it is proper in all cases. Where there has been great previous inanition, and where there are marks of langour, and feeble morbid action in the system, the remedies should be of an opposite nature. Opium and other cordials are indicated in these cases. Their salutary effects in exciting the action of the uterus, and expediting delivery, are too well known to be mentioned.

I have expressed a hope in another place,* that a medicine would be discovered that should suspend sensibility altogether, and leave irritability, or the powers of motion, unimpaired, and thereby destroy labour pains altogether. I was encouraged to cherish this hope, by having known delivery to take place, in one instance, during a paroxysm of epilepsy, and having heard of another, during a fit of drunkenness, in a woman attended by Dr. Church, in both of which there was neither consciousness, nor recollection of pain.

2. During the period in which the menses are said to dodge, and for a year or two after they cease to flow, there is a morbid fulness and excitement in the blood-vessels, which are often followed by head-ach, cough, dropsy, hæmorrhages, glandular obstructions, and cancers. They may all be prevented by frequent and moderate bleedings.

* Medical Repository, vol. vi.

3. It has been proved, by many facts, that opium, when taken in an excessive dose, acts by inducing a similar state of the system with that which is induced by the miasmata which bring on malignant and inflammatory fevers. The remedy for the disease produced by it (where a vomiting cannot be excited to discharge the opium) has been found to be copious blood-letting. Of its efficacy, the reader will find an account in four cases, published in the fifth volume of the New-York Medical Repository.

4. It is probably, from the uniformly stimulating manner in which poisons of all kinds act upon the human body, that bleeding would be useful in obviating their baneful effects. Dr. John Dorsey has lately proved its efficacy, in the case of a child that was affected with convulsions, in consequence of eating the leaves of the datura stramonium.

5. It has been the misfortune of diabetes to be considered by physicians as exclusively a local disease of weak morbid action, or as the effects of simple debility in the kidneys; and hence stimulating and tonic medicines have been exclusively prescribed for it. This opinion is not a correct one. It often affects the whole arterial system, more especially in its first stage, with great morbid action. In two cases of it, where this state of the blood-vessels took place, I have used blood-letting with success, joined with the common remedies for inflammatory diseases.

6. In intermitting fevers which have long resisted the use of bark, and all the common stimulating and tonic remedies which are employed to cure them, bleeding is generally a certain remedy. Many hundred instances of its efficacy in such cases could be mentioned from the records of the practice in the Pennsylvania hospital, as well as from the private practice of many of the physicians of Philadelphia.

7. In dislocated bones which resist both skill and force, it has been suggested, that bleeding, till fainting is induced, would probably induce such a relaxation in the muscles as to favour their reduction. This principle was happily applied, in the winter of 1795, by Dr. Physick,

in the Pennsylvania hospital, in a case of dislocated humerus of two months continuance. The doctor bled his patient till he fainted, and then reduced his shoulder in less than a minute, and with very little exertion of force. The practice has since become general in Philadelphia, in luxations of large bones, where they resist the common degrees of strength employed to reduce them.

In contemplating the prejudices against blood-letting, which formerly prevailed so generally in our country, I have been led to ascribe them to a cause wholly political. We are descended chiefly from Great-Britain, and have been for many years under the influence of English habits upon all subjects. Some of these habits, as far as they relate to government, have been partly changed; but in dress, arts, manufactures, manners, and science, we are still governed by our early associations. Britain and France have been, for many centuries, hereditary enemies. The hostility of the former to the latter nation, extends to every thing that belongs to their character. It discovers itself, in an eminent degree, in diet and medicine. Do the French love soups? the English prefer solid flesh. Do the French love their meats well cooked? the English prefer their meats but half roasted. Do the French sip coffee after dinner? the English spend their afternoons in drinking Port and Madeira wines. Do the French physicians prescribe purges and glysters to cleanse the bowels? the English physicians prescribe vomits for the same purpose. Above all, do the French physicians advise bleeding in fevers? the English physicians forbid it in most fevers, and substitute sweating in the room of it. Here then we discover the source of the former prejudices and errors of our countrymen, upon the subject of blood-letting. They are of British origin. They have been inculcated in British universities, and in British books; and they accord as ill with our climate and state of society, as the Dutch foot stoves did with the temperate climate of the Cape of Good Hope.

It is probable the bad consequences which have followed the indiscriminate use of the lancet in France, and some other countries, may have contributed in some degree to create the prejudices against it, which are entertain-

ed by the physicians in Great-Britain. Bleeding, like opium, has lost its character in many cases, by being prescribed for the *name* of a disease. It is still used, Mr. Townsend tells us, in this empirical way in Spain, where a physician, when sent for to a patient, orders him to be bled before he visits him. The late just theory of the manner in which opium acts upon the body, has restrained its mischief, and added greatly to its usefulness. In like manner, may we not hope, that just theories of diseases, and proper ideas of the manner in which bleeding acts in curing them, will prevent a relapse into the evils which formerly accompanied this remedy, and render it a great and universal blessing to mankind?

AN INQUIRY
INTO THE
COMPARATIVE STATE OF MEDICINE,
IN PHILADELPHIA,
BETWEEN
THE YEARS 1760 AND 1766, AND THE YEAR 1809.

AN INQUIRY, &c.

IN estimating the progress and utility of medicine, important advantages may be derived from taking a view of its ancient, and comparing it with its present state. To do this upon an extensive scale, would be difficult, and foreign to the design of this inquiry. I shall therefore limit it, to the history of the diseases and medical opinions which prevailed, and of the remedies which were in use, in the city of Philadelphia, between the years 1760 and 1766, and of the diseases, medical opinions, and remedies of the year 1809. The result of a comparative view of each of them, will determine whether medicine has declined or improved, in that interval of time, in this part of the world.

To derive all the benefits that are possible from such an inquiry, it will be proper to detail the causes, which, by acting upon the human body, influence the subjects that have been mentioned, in those two remote periods of time.

Those causes divide themselves into climate, diet, dress, and certain peculiar customs; on each of which I shall make a few remarks.

After what has been said, in the history of the Climate of Pennsylvania, in the second volume of these Inquiries, it will only be necessary in this place briefly to mention, that the winters in Philadelphia, between the years 1760 and 1766, were almost uniformly cold. The ground was generally covered with snow, and the Delaware frozen, from the first or second week in December, to the last week in February, or the first week in March. Thaws were rare during the winter months, and seldom of longer duration than three or four days. The springs began in May. The summers were generally warm, and the air

seldom refreshed by cool north-west winds. Rains were frequent and heavy, and for the most part accompanied with thunder and lightning. The autumns began in October, and were gradually succeeded by cool and cold weather.

The diet of the inhabitants of Philadelphia, during those years, consisted chiefly of animal food. It was eaten, in some families, three times, and in all, twice a day. A hot supper was a general meal. To two and three meals of animal food in a day, many persons added what was then called "a relish," about an hour before dinner. It consisted of a slice of ham; a piece of salted fish, and now and then a beef-steak, accompanied with large draughts of punch or toddy. Tea was taken in the interval between dinner and supper.

In many companies, a glass of wine and bitters was taken a few minutes before dinner, in order to increase the appetite.

The drinks, with dinner and supper, were punch and table beer.

Besides feeding thus plentifully in their families, many of the most respectable citizens belonged to clubs, which met in the city in winter, and in its vicinity, under sheds, or the shades of trees, in summer, once and twice a week, and in one instance every night. They were drawn together by suppers in winter, and dinners in summer. Their food was simple, and taken chiefly in a solid form. The liquors used with it were punch, London porter and sound old Madeira wine.

Independently of these clubs, there were occasional meetings of citizens, particularly of young men, at taverns, for convivial purposes. A house in Water-street, known by the name of the Tun tavern, was devoted chiefly to this kind of accidental meetings. They were often followed by midnight sallies into the streets, and such acts of violence and indecency, as frequently consigned the perpetrators of them afterwards into the hands of the civil officers and physicians of the city.

Many citizens, particularly tradesmen, met every evening for the purpose of drinking beer, at houses kept for that purpose. Instances of drunkenness were rare at such places. The company generally parted at ten o'clock,

and retired in an orderly manner to their habitations. Morning drams, consisting of cordials of different kinds, were common, both in taverns and private houses, but they were confined chiefly to the lower class of people.

From this general use of distilled and fermented liquors, drunkenness was a common vice in all the different ranks of society.

The dresses of the men, in the years alluded to, were composed of cloth in winter, and of thin woollen or silk stuffs in summer. Wigs composed the covering of the head, after middle life, and cocked hats were universally worn, except by the men who belonged to the society of Friends.

The dresses of the women, in the years before mentioned, consisted chiefly of silks and callicoës. Stays were universal, and hoops were generally worn by the ladies in genteel life. Long cloth or camblet cloaks were common, in cold weather, among all classes of women.

The principal custom under this head, which influenced health and life, was that which obliged women, after lying in, "to sit up for company;" that is to dress themselves, every afternoon on the second week after confinement, and to sit for four or five hours, exposed to the impure air of a crowded room, and sometimes to long and loud conversations.

Porches were nearly universal appendages to houses, and it was common for all the branches of a family to expose themselves upon them, to the evening air. Stoves were not in use at that time, in any places of public worship.

Funerals were attended by a large concourse of citizens, who were thereby often exposed to great heat and cold, and sometimes to standing, while the funeral obsequies were performed, in a wet or damp church-yard.

The human mind, in this period of the history of our city, was in a colonized state, and the passions acted but feebly and partially upon literary and political subjects.

We come now to mention the diseases which prevailed in our city between the years 1760 and 1766.

The cholera morbus was a frequent disease in the summer months.

Sporadic cases of dysentery were at that time common. I have never seen that disease epidemic in Philadelphia.

The intermitting fever prevailed in the month of August, and in the autumn, chiefly in the suburbs and neighbourhood of the city. In the year 1765, it was epidemic in Southwark, and was so general, at the same time, as to affect two thirds of the inhabitants of the southern states. This fact is mentioned by Dr Bond, in a lecture preserved in the minutes of the managers of the Pennsylvania hospital.

The slow chronic fever, called at that time the nervous fever, was very common, in the autumnal months, in the thickly settled parts of the city.

The bilious fever prevailed, at the same time, in Southwark. The late Dr. Clarkson, who began to practice medicine in that part of the city, in the year 1761, upon hearing some of his medical brethren speak of the appearance of bilious remittents in its middle and northern parts, about the year 1778, said they had long been familiar to him, and that he had met with them every year since his settlement in Philadelphia. *

The yellow fever prevailed in the neighbourhood of Spruce-street wharf, and near a filthy stream of water which flowed through what is now called Dock-street, in the year 1762. Some cases of it appeared likewise in Southwark. It was scarcely known in the north and west parts of the city. No desertion of the citizens took place at this time, nor did the fear of contagion drive the friends of the sick from their bed-sides, nor prevent the usual marks of respect being paid to them after death, by following their bodies to the grave. A few sporadic cases of the same grade of fever appeared in the year 1763.

Pneumonics, rheumatisms, inflammatory sore throats, and catarrhs were frequent during the winter and spring months. The last disease was induced, not only by sudden changes in the weather, but often by exposure to the

* From the early knowledge this excellent physician and worthy man had thus acquired of the bilious remitting fever, he was very successful in the treatment of it. It was by instruction conveyed by him to me with peculiar delicacy, that I was first taught the advantages of copious evacuations from the bowels in that disease. I had been called, when a young practitioner, to visit a gentleman with him in a bilious pleurisy. A third or fourth bleeding, which I advised cured him. The doctor was much pleased with its effect, and said to me afterwards, "Doctor, you and I have each a great fault in our practice; I do not bleed enough, you do not purge enough."

evening air on porches in summer, and by the damp and cold air of places of public worship in winter.

The influenza was epidemic in the city in the spring of the year 1761.

The malignant sore throat proved fatal to a number of children in the winter of 1763.

The scarlet fever prevailed generally in the year 1764. It resembled the same disease, as described by Dr. Sydenham, in not being accompanied by a sore throat.

Death from convulsions, in pregnant women, also from parturition, and the puerperile fever, were common between the years 1760 and 1766. Death was likewise common between the 50th and 60th years of life from gout, apoplexy, palsy, obstructed livers, and dropsies. A club, consisting of about a dozen of the first gentlemen in the city, all paid, for their intemperance, the forfeit of their lives between those ages, and most of them with some one, or more of the diseases that have been mentioned. I sat up with one of that club on the night of his death. Several of the members of it called at his house, the evening before he died, to inquire how he was. One of them upon being informed of his extreme danger, spoke in high and pathetic terms of his convivial talents and virtues, and said, " he had spent 200 evenings a year with him, for the last twenty years of his life." These evenings were all spent at public houses.

The colica pictonum, or dry gripes, was formerly a common disease in this city. It was sometimes followed by a palsy of the upper and lower extremities. Colics from crapulas were likewise very frequent, and now and then terminated in death.

Many children died of the cholera infantum, cynanche trachealis, and hidrocephalus internus. The last disease was generally ascribed to worms.

Fifteen or twenty deaths occurred, every summer, from drinking cold pump water, when the body was in a highly excitable state, from great heat and labour.

The small pox, within the period alluded to, was sometimes epidemic, and carried off many citizens. In the year 1759, Dr. Barnet was invited from Elizabeth-town, in New-Jersey, to Philadelphia, to inoculate for the small-

pox. The practice, though much opposed, soon became general. About that time, Dr. Redman published a short defence of it, and recommended the practice to his fellow-citizens in the most affectionate language. The success of inoculation was far from being universal. Subsequent improvements in the mode of preparing the body, and treating the eruptive fever, have led us to ascribe this want of success to the deep wound made in the arm, to the excessive quantity of mercury given to prepare the body, and to the use of a warm regimen in the eruptive fever.

The peculiar customs and the diseases which have been enumerated, by inducing general weakness, rendered the pulmonary consumption a frequent disease among both sexes.

Pains and diseases from decayed teeth were very common between the years 1760 and 1766. At that time, the profession of a dentist was unknown in the city.

The practice of physic and surgery were united, during those years, in the same persons, and physicians were seldom employed as man-midwives, except in preternatural and tedious labours.

The practice of surgery was regulated by Mr. Sharp's treatise upon that branch of medicine.

Let us now take a view of the medical opinions which prevailed at the above period, and of the remedies which were employed to cure the diseases that have been mentioned.

The system of Dr. Boerhaave then governed the practice of every physician in Philadelphia. Of course diseases were ascribed to morbid acrimonies, and other matters in the blood, and the practice of those years was influenced by a belief in them. Medicines were prescribed to thin, and to incassate the blood, and diet drinks were administered in great quantities, in order to alter its qualities. Great reliance was placed upon the powers of nature, and critical days were expected with solicitude, in order to observe the discharge of the morbid cause of fevers from the system. This matter was looked for chiefly in the urine, and glasses to retain it were a necessary part of the furniture of every sick room. To ensure the discharge of the supposed morbid matter of fevers through

the pores, patients were confined to their bed-, and fresh, and even cool air, often excluded by close doors and curtains. The medicines to promote sweats were generally of a feeble nature. The spiritus mindereri, and the spirit of sweet nitre were in daily use for that purpose. In dangerous cases, saffron and Virginia snake-root were added to them.

Blood-letting was used plentifully in pleurisies and rheumatisms, but sparingly in all other diseases. Blood was often drawn from the feet, in order to excite a revulsion of disease from the superior parts of the body. It was considered as unsafe, at that time, to bleed during the monthly disease of the female sex.

Purges or vomits began the cure of all febrile diseases, but as the principal dependence was placed upon sweating medicines, those powerful remedies were seldom repeated in the subsequent stages of fevers. To this remark there was a general exception in the yellow fever of 1762. Small doses of glauher's salts were given every day after bleeding, so as to promote a gentle, but constant discharge from the bowels.

The bark was administered freely in intermittents. The prejudices against it at that time were so general among the common people, that it was often necessary to disguise it. An opinion prevailed among them, that it lay in their bones, and that it disposed them to take cold. It was seldom given in the low and gangrenous states of fever, when they were not attended with remissions.

The use of opium was confined chiefly to ease pain, to compose a cough, and to restrain preternatural discharges from the body. Such were the prejudices against it, that it was often necessary to conceal it in other medicines. It was rarely taken without the advice of a physician.

Mercury was in general use in the years that have been mentioned. I have said it was given to prepare the body for the small-pox. It was administered by my first preceptor in medicine, Dr. Redman, in the same disease, when it appeared in the natural way, with malignant or inflammatory symptoms, in order to keep the salivary glands open and flowing, during the turn of the pock.

He gave it likewise liberally in the dry gripes. In one case of that disease, I well remember the pleasure he expressed, in consequence of its having affected his patient's mouth.

But to Dr. Thomas Bond the city of Philadelphia is indebted for the introduction of mercury into general use, in the practice of medicine. He called it emphatically "a revolutionary remedy," and prescribed it in all diseases which resisted the common modes of practice. He gave it liberally in the cynanche trachealis. He sometimes cured madness, by giving it in such quantities as to excite a salivation. He attempted to cure pulmonary consumption by it, but without success; for, at that time, the influence of the relative actions of different diseases and remedies, upon the human body, was not known, or, if known, no advantage was derived from it in the practice of medicine.

The dry gripes were cured, at that time, by a new and peculiar mode of practice, by Dr. Thomas Cadwallader. He kept the patient easy by gentle anodynes, and gave lenient purges only in the beginning of the disease; nor did he ever assist the latter by injections till the fourth and fifth days, at which time the bowels discharged their contents in an easy manner. It was said this mode of cure prevented the paralytic symptoms, which sometimes follow that disease. It was afterwards adopted and highly commended by the late Dr. Warren, of London.

Blisters were in general use, but seldom applied before the latter stage of fevers. They were prescribed, for the first time, in hæmorrhages, and with great success, by Dr. George Glentworth.

Wine was given sparingly, even in the lowest stage of what were then called putrid and nervous fevers.

The warm and cold baths were but little used in private practice. The former was now and then employed in acute diseases. They were both used in the most liberal manner, together with the vapour and warm air baths, in the Pennsylvania hospital, by Dr. Thomas Bond. An attempt was made to erect warm and cold baths, in the neighbourhood of the city, and to connect them with a house of entertainment, by Dr. Lauchlin M'Clen, in the year 1761. The project was considered as unfriendly

to morals, and petitions, from several religious societies, were addressed to the governor of the province, to prevent its execution. The enterprize was abandoned, and the doctor soon afterwards left the city.

Riding on horseback, the fresh air of the seashore, excursions to mineral springs, and long journies, were often prescribed to invalids, by all the physicians of that day.

I come now to mention the causes which influence the diseases, also the medical opinions and remedies of the present time. In this part of our discourse, I shall follow the order of the first part of our inquiry.

I have already taken notice of the changes which the climate of Philadelphia has undergone since the year 1766.

A change has of late years taken place in the dress of the inhabitants of Philadelphia. Wigs have generally been laid aside, and the hair worn cut and dressed in different ways. Round hats, with high crowns, have become fashionable. Umbrellas, which were formerly a part of female dress only, are now used in warm and wet weather, by men of all ranks in society; and flannel is worn next to the skin in the winter, and muslin in summer, by many persons of both sexes. Tight dresses are uncommon, and stays are unknown among our women. It is to be lamented that the benefits to health which might have been derived from the disuse of that part of female dress, have been prevented by the fashion of wearing such light coverings over the breasts and limbs. The evils from this cause, shall be mentioned hereafter.

A revolution has taken place in the diet of our citizens. Relishes and suppers are generally abolished; bit-ters, to provoke a preternatural appetite, also meridian bowls of punch, are now scarcely known. Animal food is eaten only at dinner, and excess in the use of it is prevented, by a profusion of excellent summer and winter vegetables.

Malt liquors, or hydrant water, with a moderate quantity of wine, are usually taken with those simple and wholesome meals.

Clubs, for the exclusive purpose of feeding, are dissolved, and succeeded by family parties, collected for the more rational entertainments of conversation, dancing, music, and chess. Taverns and beer houses are much less frequented than formerly, and drunkenness is rarely seen in genteel life. The tea table, in an evening, has now become the place of resort of both sexes, and the midnight serenade has taken place of the midnight revels of the young gentlemen of former years.

In doing justice to the temperance of the modern citizens of Philadelphia, I am sorry to admit, there is still a good deal of secret drinking among them. Physicians, who detect it by the diseases it produces, often lament the inefficacy of their remedies to remove them. In addition to intemperance from spirituous liquors, a new species of intoxication from opium has found its way into our city. I have known death, in one instance, induced by it.

The following circumstances have had a favourable influence upon the health of the present inhabitants of Philadelphia.

The improvements in the construction of modern houses, so as to render them cooler in summer, and warmer in winter.

The less frequent practice of sitting on porches, exposed to the dew, in summer evenings.

The universal use of stoves in places of public worship.

The abolition of the custom of obliging lying-in women to sit up for company.

The partial use of Schuylkill or hydrant water, for culinary and other purposes.

The enjoyment of pure air, in country seats, in the neighbourhood of the city. They not only preserve from sickness during the summer and autumn, but they render families less liable to diseases during the other seasons of the year.

And, lastly, the frequent use of private, and public warm and cold baths. For the establishment of the latter, the citizens of Philadelphia are indebted to Mr. Joseph Simons.

The following circumstances have an unfavourable influence upon the health of our citizens.

Ice creams taken in excess, or upon an empty stomach.

The continuance of the practice of attending funerals, under all the circumstances that were mentioned in describing the customs which prevailed in Philadelphia, between the years 1760 and 1766.

The combined influence of great heat and intemperance in drinking, acting upon passions unusually excited by public objects, on the 4th of July every year.

The general and inordinate use of segars.

The want of sufficient force in the water which falls into the common sewers to convey their contents into the Delaware, renders each of their apertures a source of sickly exhalations to the neighbouring streets and squares.

The compact manner in which the gutters are now formed, by preventing the descent of water into the earth, has contributed very much to retain the filth of the city, in those seasons in which they are not washed by rain, nor by the waste water of the pumps and hydrants.

The timbers of many of the wharves of the city have gone to decay. The docks have not been cleaned since the year 1774, and many of them expose large surfaces to the action of the sun at low water. The buildings have increased in Water-street, and with them there has been a great increase of that kind of filth which is generated in all houses; the stores in this street often contain matters which putrefy; from all which there is, in warm weather, a constant emission of such a fœtid odour, as to render a walk through that street, by a person who does not reside there, extremely disagreeable, and sometimes to produce sickness and vomiting.

In many parts of the vicinity of the city are to be seen pools of stagnating water, from which there are exhaled large quantities of unhealthy vapours, during the summer and autumnal months.

The privies have become so numerous, and are often so full, as to become offensive in most of the compact parts of the city, more especially in damp weather.

The pump water is impregnated with many saline and erial matters of an offensive nature.

While these causes exert an unfriendly influence upon the bodies of the citizens of Philadelphia, the extreme elevation or depression of their passions, by the different issues of their political contests, now far surpassing, in their magnitude, the contests of former years, together with their many new and fortuitous modes of suddenly acquiring and losing property, predispose them to many diseases of the mind.

The present diseases of Philadelphia come next under our consideration.

Fevers have assumed several new forms since the year 1766. The mild billious fever has gradually spread over every part of the city. It followed the filth which was left by the British army in the year 1778. In the year 1780, it prevailed, as an epidemic, in Southwark, and in Water and Front-streets, below Market-street.* In the years 1791 and 1792, it assumed an inflammatory appearance, and was accompanied, in many cases, with hepatic affections. The connection of our subject requires that I should barely repeat, that it appeared in 1793 as an epidemic, in the form of what is called yellow fever, in which form it has appeared, in sporadic cases, or as an epidemic, nearly every year since. During the reign of this high grade of bilious fever, mild intermittents and remittents, and the chronic or nervous forms of the summer and autumnal fever, have nearly disappeared.

Inflammations and obstructions of the liver have been more frequent than in former years, and even the pneumonies, catarrhs, intercurrent, and other fevers of the winter and spring months, have all partaken more or less of the inflammatory and malignant nature of the yellow fever.

The pulmonary consumption continues to be a common disease among both sexes. Women are more subject to it than men, in consequence of their light dresses, and particularly of the exposure of their upper arms (a part of the body with which the lungs sympathise in a peculiar man-

* It appears, from the account given by Mr. White of the billious fever of Ba'n, that it prevailed several years in its suburbs, before it became general in that city. It is remarkable, that Southwark was nearly the exclusive seat, not only of the bilious or breakbone fever of 1780, but of the intermitting fever in 1765, taken notice of by Dr. Bond, and of the yellow fever of 1805.

ner) to the cold air. The frequency of consumptions from this cause, has given rise to a saying that "the nakedness of the women, is the clothing of the physicians."

The cynanche trachealis, the scarlatina anginosa, the hydrocephalus internus, and cholera infantum, are likewise common diseases in Philadelphia.

Madness, and several other diseases of the mind, have increased since the year 1766, from causes which have been mentioned.

Several of the different forms of gout are still common among both sexes.

Apoplexy and palsy have considerably diminished in our city. It is true, the bills of mortality still record a number of deaths from the former, every year; but this statement is incorrect, if it mean a disease of the brain only, for sudden deaths from all their causes are returned exclusively under the name of apoplexy. The less frequent occurrence of this disease, also of palsy, is probably occasioned by the less consumption of animal food, and of distilled and fermented liquours, by that class of citizens who are most subject to them, than in former years. Perhaps the round hat, and the general use of umbrellas, may have contributed to lessen those diseases of the brain.

The dropsy is now a rare disease, and seldom seen even in our hospital.

The colica pictonum, or dry gripes, is scarcely known in Philadelphia. I have ascribed this to the use of flannel next to the skin as a part of dress, and to the general disuse of punch as a common drink.

The natural small-pox is nearly extirpated, and the puerperile fever is rarely met with in Philadelphia. The scrophula is much less frequent than in former years. It is confined chiefly to persons in humble life.

I proceed, in the order that was proposed, to take notice of the present medical opinions which prevail among the physicians of Philadelphia. The system of Dr. Boerhaave long ago ceased to regulate the practice of physic. It was succeeded by the system of Dr. Cullen. In the year 1790, Dr. Brown's system of medicine was introduced

and taught by Dr. Gibbon. It captivated a few young men for a while, but it soon fell into disrepute. Perhaps the high-toned diseases of our city exposed the fallacy and danger of the remedies inculcated by it, and afforded it a shorter life than it has had in many other countries. In the year 1790, the author of this inquiry promulgated some new principles in medicine suggested by the peculiar phænomena of the diseases of the United States. These principles have been so much enlarged and improved by the successive observations and reasonings of many gentlemen in all the states, as to form a new system of medicine. This system rejects the nosological arrangement of diseases, and admits only of a single disease, consisting in different forms of morbid excitement, induced by irritants acting upon previous debility. It rejects further, an undue reliance upon the powers of nature, and teaches, instantly to wrest the cure of all violent and feeble diseases out of her hands; and lastly it rejects prescriptions for the names of diseases; and by directing their application wholly to their forming and fluctuating states, derives from a few active medicines all the advantages which have been in vain expected from the numerous articles which compose European treatises upon the materia medica. This system has been adopted by a part of the physicians of Philadelphia, but a respectable number of them are still attached to the system of Dr. Cullen.

A great change has taken place in the remedies which are now in common use in Philadelphia. I shall briefly mention such of them as are new, and then take notice of the new and different modes of exhibiting such as were in use between the years 1760 and 1766.

Vaccination has been generally adopted in our city, in preference to inoculation with variolous matter.

Digitalis, lead, zinc, and arsenic are now common remedies in the hands of most of our practitioners.

Cold air, cold water, and ice are among the new remedies of modern practice in Philadelphia.

Blood-letting is now used in nearly all diseases of violent excitement, not only in the blood-vessels, but in other parts of the body. Its use is not, as in former times, limited to ounces in specific diseases, but regulated by

their force, and the importance of the parts affected to health and life; nor is it forbidden, as formerly, in infancy nor in extreme old age, nor in the summer months, nor in those cases in which the blood is dissolved, or devoid of an inflammatory crust, provided the pulse be full or tense, nor in the period of menstruation, where symptoms of a violent, or of a suffocated disease, manifested by an active or feeble pulse, indicate it to be necessary.

Leeches are now in general use in diseases which are removed, by their seat or local nature, beyond the influence of the lancet. For the introduction of this excellent remedy into our city we are indebted to Mr. John Cunitz.

Opium and bark, which were formerly given in disguise, or with a trembling hand, are now, not only prescribed by physicians, but often purchased, and taken without their advice, by many of the citizens of Philadelphia. They even occupy a shelf in the closets of many families.

The use of mercury has been revived, and a salivation has been extended, with great improvements and success, to nearly all violent and obstinate diseases. Nor has the influence of reason over ignorance and prejudice, with respect to that noble medicine, stopped here. Cold water, once supposed to be incompatible with its use, is now applied to the body, in malignant fevers, in order to insure and accelerate its operation upon the salivary glands. But this is not all. It is applied locally, and universally to restrain, or to check a salivation, when it exceeds in its degree or duration, the exigencies of a disease, or the wishes of a physician.

Wine is given in large quantities, when indicated, without the least fear of producing intoxication.

The warm and cold baths, which were formerly confined chiefly to patients in the Pennsylvania hospital, are now common prescriptions in private practice.

Exercise, country air, mineral springs, and the sea shore, are now universally recommended in chronic diseases, and in the debility which precedes and follows them.

Great pains are now taken to regulate the quantity and quality of aliments and drinks, by the peculiar state of the system.

Let us now inquire into the influence of the new opinions in medicine, and the new remedies which have been mentioned, upon human life.

The small-pox, once the most fatal and universal of all diseases, has nearly ceased to occupy a place in our bills of mortality, by the introduction of vaccination in our city. For the prompt adoption of this great discovery, the citizens of Philadelphia owe a large debt of gratitude to Dr. Coxe, and Mr. John Vaughan.

Fevers, from all their causes, and in all their forms, with the exception of the bilious yellow fever, now yield to medicine. Even that most malignant form of febrile diseases is treated with more success in Philadelphia than in other countries. It would probably seldom prove mortal, did a belief in its being derived from an impure atmosphere, and of its exclusive influence upon the body, while it prevailed as an epidemic, obtain universally among the physicians and citizens of Philadelphia.

The pulmonary consumption has been prevented, in many hundred instances, by meeting its premonitory signs, in weakness and feeble morbid excitement in the whole system, by country air, gentle exercise, and gently stimulating remedies. Even when formed, and tending rapidly to its last stage, it has been cured by small and frequent bleedings, digitalis, and a mercurial salivation.

The hydrocephalus internus, the cynanche trachealis, and cholera infantum, once so fatal to the children of our city, now yield to medicine in the early stages. The two former are cured by copious bleeding, aided by remedies formerly employed in them without success. The last is cured by moderate bleeding, calomel, laudanum, and country air.

The gout has been torn from its ancient sanctuary in error and prejudice, and its acute paroxysms now yield with as much certainty to the lancet, as the most simple inflammatory diseases.

The dropsy is cured by renouncing the unfortunate association of specific remedies with its name, and accom-

modating them to the degrees of excitement in the blood-vessels.

The tetanus from wounds is now prevented, in most cases, by inflaming the injured parts, and thereby compelling them to defend the whole system, by a local disease. Where this preventing remedy has been neglected, and where tetanus arises from other causes than wounds, it has often been cured by adding to the diffusible stimulus of opium, the durable stimuli of bark and wine.

Death from drinking cold water, in the heated state of the body, is now obviated by previously wetting the hands or feet with the water; and when this precaution is neglected, the disease induced by it, is generally cured by large doses of liquid laudanum.

Madness, which formerly doomed its miserable subjects to cells or chains for life, has yielded to bleeding, low diet, mercury, the warm and cold baths, fresh air, gentle exercise, and mild treatment, since its seat has been discovered to be in the blood-vessels of the brain.

The last achievement of our science in Philadelphia, that I shall mention, consists in the discovery and observation of the premonitory signs of violent and mortal diseases, and in subduing them by simple remedies, in their forming state. By this means, death has been despoiled of his prey, in many hundred instances.

In this successful conflict of medicine with disease and death, midwifery and surgery have borne a distinguished part. They derive their claims to the gratitude of the citizens of Philadelphia from the practice of each of them being more confined, than formerly, to a few members of our profession. It is in consequence of the former being exercised only by physicians of regular and extensive education, that death from pregnancy and parturition is a rare occurrence in Philadelphia. For the discovery and introduction of the means of preventing it from the latter disease by copious blood-letting, also for the discovery of the partial inversion of the uterus, and the method of reducing it, the citizens of Philadelphia are indebted to Dr. De-wees.

I should greatly exceed the limits prescribed to this inquiry, should I mention how much pain and misery have been relieved, and how often death has been baffled in his

attempts upon human life, by several late improvements in old, and the discovery of new remedies in surgery. I shall briefly name a few of them.

In cases of blindness, from a partial opacity of the cornea, or from a closure of the natural pupil, a new pupil has been made; and where the cornea has been partially opaque, the opening through the iris has been formed, opposite to any part of it, which retain its transparency.

The cure of fractures has been accelerated by blood-letting, and, where the union of a broken bone has not taken place from a defect of bony matter, it has been produced by passing a seton between the fractured ends of the bone, and effecting a union thereby between them. Luxations, which have long resisted both force and art, have been reduced in a few minutes, and without pain, by bleeding at diliquium animi.

Old sores have been speedily healed, by destroying their surfaces, and thereby placing them in the condition of recent accidents.

Erysipelas is cured, and external mortifications are checked, by the application of blisters to the parts affected.

The fruitless application of the trepan, in concussions in the brain, has been prevented by copious bleeding and a salivation.

A suppression of urine has been cured, by the addition of a piece of a bougie, to a flexible catheter.

Strictures in the urethra have been removed by means of a caustic, also, in a more expeditious way, by dividing them with a lancet.

Hydrocele has been cured by a small puncture, and afterwards exciting inflammation and adhesion by an injection of wine into the tunica vaginalis testis.

The popliteal aneurism and varicose veins have both been removed by operations that were unknown a few years ago.

For the introduction of several of those new surgical remedies, and for the discovery and improvement of others, the citizens of Philadelphia are indebted to Dr. Physick. They are likewise indebted to him and Dr. Griffiths for many of the new and successful modes of practice, in the

diseases that have been mentioned. Even the few remedies that have been suggested by the author of these inquiries, owe their adoption and usefulness chiefly to the influence of those two respectable and popular physicians.

Before I dismiss this part of our subject, I have only to add, that since the cure and extraction of the teeth have become a distinct branch of the profession of medicine, several diseases which have arisen from them, when decayed, have been detected and cured.*

We have thus taken a comparative view of the medical theories and remedies of former and modern times, and of their different influence upon human life. To exhibit the advantages of the latter over the former, I shall mention the difference in the number of deaths in three successive years, at a time when the population of the city and suburbs was supposed to amount to 30,000 souls, and in three years, after the population exceeded double that number.

Between the 25th of December, 1771, and the 25th of December, 1772, there died 1291 persons.

Between the same days of the same months, in 1772 and 1773, there died 1344 persons.

Within the same period of time, between 1773 and 1774, the deaths amounted to 1021, making in all 3,656. I regret that I have not been able to procure the returns of deaths in years prior to those which have been mentioned. During the three years that have been selected, no unusual mortal diseases prevailed in the city. The measles were epidemic in 1771, but were not more fatal than in common years.

Between the 25th of December, 1799, and the 25th of December, 1800, there died 1525 persons.

Between the same days of the same months, in the years 1801 and 1802, there died 1362 persons.

Within the same period of time, between 1802 and 1803, the deaths amounted to 1796, making in all 4,883.

Upon these returns it will be proper to remark, that several hundreds of the deaths, in 1802 and 1803, where

* The late Mr. Andrew Spence was the first regular bred dentist that settled in Philadelphia. There are now several well educated gentlemen in the city of that profession.

from the yellow fever, and that many of them were of strangers. Of 68 persons, who were interred in the Swedes' church-yard alone, one half where of that description of people. Deducting 500 from both those causes of extra-mortality in the three years, between 1799 and 1803, the increase of deaths above what they were in the years 1771 and 1774 is but 727. Had diseases continued to be as mortal as they were thirty years ago, considering the present state of our population, the number of deaths would have been more than 7,312.

To render the circumstances of the statement of deaths that has been given perfectly equal, it will be necessary to add, that the measles prevailed in the city, in the year 1802, as generally as they did in 1771.

From the history that has been given, of the effects of the late improvements and discoveries in medicine upon human life, in Philadelphia, we are led to appreciate its importance and usefulness. It has been said, by its enemies, to move; but its motions have been asserted to be only in a circle. The facts that have been stated clearly prove, that it has moved, and rapidly too, within the last thirty years, in a straight line.

To encourage and regulate application and enterprize in medicine hereafter, let us inquire to what causes we are indebted for the late discoveries and improvements in our science, and for their happy effects in reducing the number of deaths so far below their former proportion to the inhabitants of Philadelphia.

The *first* cause I shall mention is the great physical changes which have taken place in the manners of our citizens in favour of health and life.

A *second* cause, is the assistance which has been afforded to the practice of physic, by the numerous and important discoveries that have lately been made in anatomy, natural history, and chemistry, all of which have been conveyed, from time to time, to the physicians of the city, by means of the Philadelphia and hospital libraries, and by the lectures upon those branches of science which are annually delivered in the university of Pennsylvania.

3. The rejection of the supposed healing powers of nature in all diseases of great, and feeble morbid action, and the preference which is given to the more prompt, and

safe method of curing them by means of artificial remedies, have added very much to the utility and credit of medicine in our city.

4. The application of reasoning to our science has contributed greatly to extend its success in the cure of diseases. Simply to observe and to remember, are the humblest operations of the human mind. Brutes do both. But to ~~theorize~~, that is, to *think*, or in other language, to compare facts, to reject counterfeits, to dissolve the seeming affinity of such as are not true, to combine those that are related, though found in remote situations from each other, and, finally, to deduce practical and useful inferences from them, are the high prerogatives and interest of man, in all his intellectual pursuit, and in none more than in the profession of medicine.

5. The accommodation of remedies to the changes which are induced in diseases by the late revolutions in our climate, seasons, and manners, has had a sensible influence in improving the practice of medicine in our city. The same diseases, like the descendants of the same families, lose their resemblance to each other by the lapse of time; and the almanacks of 1803 might as well be consulted to inform us of the monthly phases of the moon of the present year, as the experience of former years, or the books of foreign countries, be relied upon to regulate the practice of physic at the present time, in any of the cities of the United States.

6. From the diffusion of medical knowledge among all classes of our citizens, by means of medical publications, and controversies, many people have been taught so much of the principles and practice of physic, as to be able to prescribe for themselves in the forming state of acute diseases, and thereby to prevent their fatal termination. It is to this self-acquired knowledge among the citizens of Philadelphia, that physicians are in part indebted for not being called out of their beds so frequently as in former years. There are few people who do not venture to administer laudanum in bowel complaints, and there are some persons in the city, who have cured the cynanche trachealis when it has occurred in the night, by vomits and bleeding, without the advice of a physician. The disuse of suppers

is another cause why physicians enjoy more rest at night than formerly, for many of their midnight calls, were to relieve diseases brought on by that superfluous meal.

7. The dispensary instituted in our city, in the year 1786, for the medical relief of the poor, has assisted very much in promoting the empire of medicine over disease and death. Some lives have likewise been saved by the exertions of the humane society, by means of their printed directions to prevent sudden death; also, by the medical services which have lately been extended to our patients, by order of the managers of the Pennsylvania hospital.

8thly and lastly. A change, favourable to successful practice in Philadelphia, has taken place in the conduct of physicians to their patients. A sick room has ceased to be the theatre of imposture in dress and manners, and prescriptions are no longer delivered with the pomp and authority of edicts. On the contrary, sick people are now instructed in the nature of their diseases, and informed of the names and design of their medicines, by which means faith and reason are made to co-operate in adding efficacy to them. Nor patients left, as formerly, by their physicians, under the usual appearances of dissolution, without the aid of medicine. By thus disputing every inch of ground with death, many persons have been rescued from the grave, and lived years afterwards, monuments of the power of the healing art.

From a review of what has been effected within the last nine and thirty years, in lessening the mortality of many diseases, we are led to look forward with confidence and pleasure to the future achievements of our science.

Could we lift the curtain of time which separates the year 1847 from our view, we should see cancers, pulmonary consumptions, apoplexies, palsies, epilepsy and hydrophobia struck out of the list of mortal diseases, and many others which still retain an occasional power over life, rendered perfectly harmless, *provided* the same number of discoveries and improvements shall be made in medicine in the intermediate years, that have been made since the year 1766.

But in vain will the avenues of death from those diseases be closed, while the more deadly yellow fever is permitted to supply their place, and to spread terror, dis-

tress, and poverty through the city, by destroying the lives of her citizens by hundreds or thousands every year. Dear cradle of liberty of conscience in the western world ! nurse of industry and arts ! and patron of pious and benevolent institutions ! may this cease to be thy melancholy destiny ! may Heaven dispel the errors and prejudices of thy citizens upon the cause and means of preventing their pestilential calamities ! and may thy prosperity and happiness be revived, extended, and perpetuated for ages yet to come !

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